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Abstract

Inequality in Latin America is much higher than in Europe and the US. The income distribution in the region is also much more skewed, displaying a thicker left tail. And, like those comparison economies, it also exhibits a long right tail. We illustrate the link between this bipolar character of inequality in the region and the similarly bipolar character of the distribution of productive units, where income is generated. The firm size distribution in Latin America is dominated by a plethora of tiny businesses, which absorb several times more employment than in the US and Europe and exhibit a much lower relative productivity, while its upper tail exhibits higher market concentration. 34% of the distance in the 50/10 personal income gap between Latin America and the US is explained by a higher concentration of workers in the categories with poorer relative income and productivity: self-employment and employment in micro establishments. In the right tail of the income distribution, the larger 90/50 personal income gap in the region compared to the US is fully explained by the larger relative income of business owners of large firms with high relative markups. We show that market concentration in the region is large and tied to small labor shares. It is also closely tied to the extreme dispersion of productivity and the prevalence of low productivity businesses. The central message is that high inequality in the region is deeply rooted in the productivity problem.

JEL Code: D63, D43, D24, N36
Keywords: Inequality, market power, productivity, Latin America.

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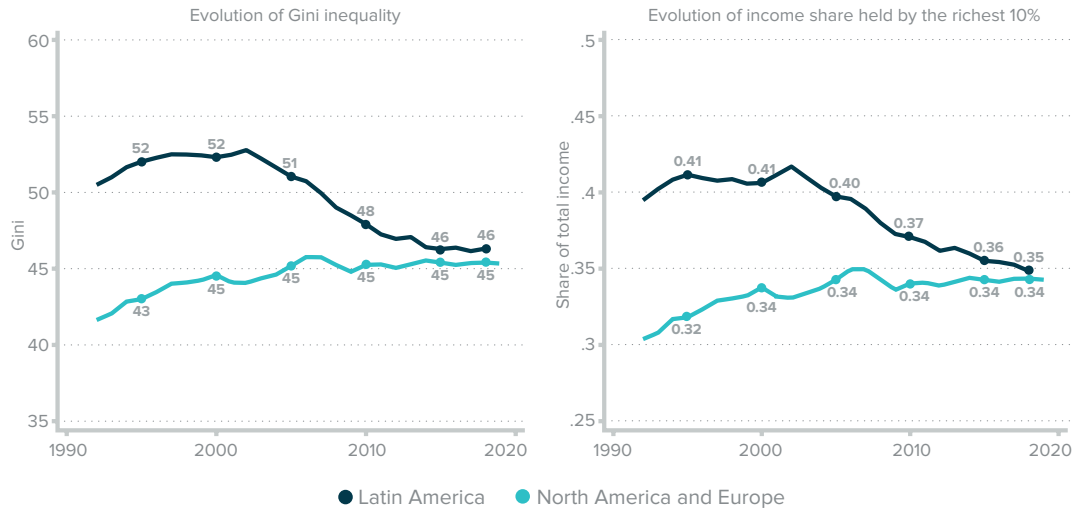
1. Introduction

The relationship between market power and inequality has been a focus of recent attention. At a global scale, or at least in much of the developed world, the fraction of income and wealth in the hands of the richest individuals has grown since 1990, while the labor share of national income has shrunk, and average market power has increased. The picture that emerges is one where a few superstar firms have seized an increasingly large share of their respective markets and where most of their additional gains have gone to their shareholders, leaving an increasingly large fraction of the world's resources in the hands of that small mass of privileged individuals. Latin America (LA hereafter) appears as an exception to this story of increasing inequality and market concentration: in the past two decades, the region successfully brought millions out of poverty, and inequality declined slightly (Figure 1). The average LA markup does not show the increasing trend that has been illustrated for other regions (Figure 2 from De Loecker et al. 2020).[1]

Figure 1. Inequality in Latin America vs. North America and Europe



Note: Average from Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, and Uruguay for Latin America and Austria, Belgium, Canada, Denmark, Germany, Finland, France, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, and the United States for North America and Europe. Source: Gasparini & Cruces (2021) for Latin America and World Inequality Database (2021) for North America and Europe, own calculations.

This does not mean that inequality and market power are of no concern for Latin America—quite the opposite. Income and wealth inequality remain high in the region, much higher than in advanced and other middle-income economies (Figure 1, reproduced in the Appendix for each of 15 LA economies). Measures of market power are also high, suggesting high

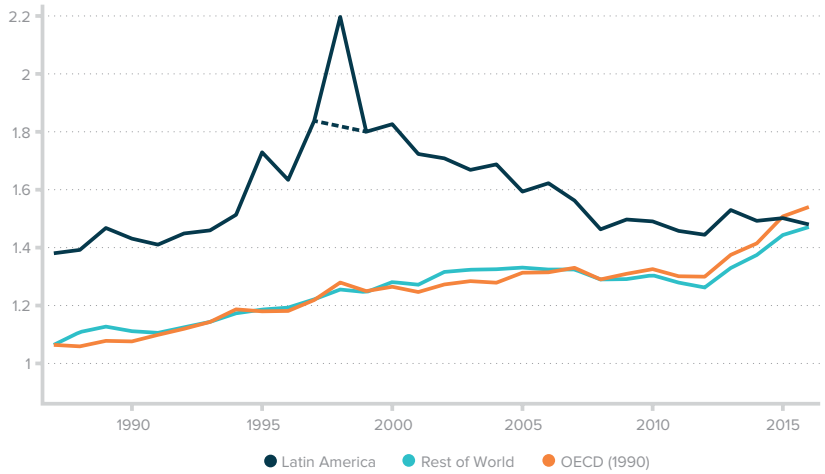
[1] Using data from firms' financial statements in the Worldscope dataset, these authors build a dataset that allows them to follow countries over the same period, including seven from LA: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela. The proportion of LA firms with financial statements in the Worldscope dataset is significantly smaller than the proportion of OECD firms, so these data may not be fully comparable. The De Loecker, Eekhout, and Unger dataset is by construction biased towards LA medium and large firms.

market concentration (Figure 2), and the labor share of aggregate income is much lower in the region than in advanced economies (i.e., De Gregorio, 1992).

What is the relationship between market concentration and market fragmentation and inequality in the region? This is the question that we tackle in this paper. Though when talking about market concentration and inequality, it is tempting to focus solely on the reasons that underlie the access of a few to exorbitant income (and this is certainly part of the story in Latin America), greater income inequality in the region compared to many advanced economies (AEs) is also associated with the fact that the left tail of the income distribution is much thicker.

Figure 3 and Figure 4 illustrate this using data from household surveys. The Appendix also reproduces these figures for each LA country in our sample separately. Figure 3 shows a much thicker left tail for Latin America than for the US and Europe in Figure 3. Notice this holds true regardless of whether we look at household income adjusted to recover pre-tax income or unadjusted.[2] Figure 4 presents personal income for different segments of the distribution of workers, relative to the median of that distribution. Above the median, ratios are DX/P50 where DX is the average income of decile X and P50 is the median income. Below the median, ratios are P50/DX. Not only is the curve for LA steeper, indicating higher inequality, but it is also more tilted to the left. The P50/D1 ratio is 7.3 in Latin America vs. 5.6 in the US. The difference on the right is much more muted: 5.5 in Latin America vs. 5.3 in the US.

Figure 2. Markups in Latin America and other regions



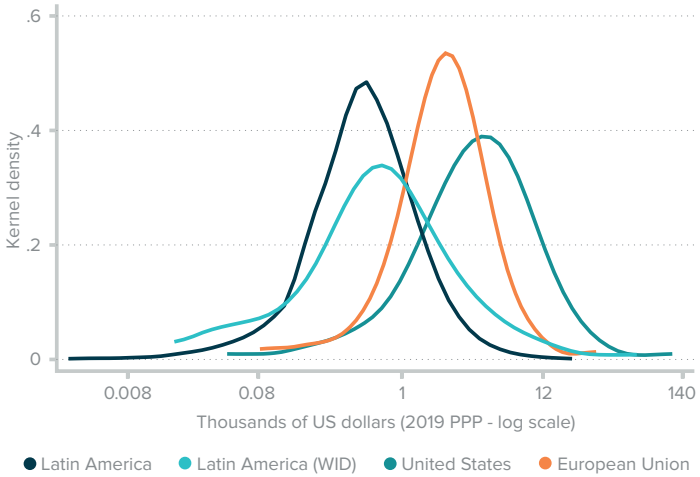
Note: Markups obtained from De Loecker & Eeckhout (2018) from financial statements of firms in the Worldscope dataset. Average markup by year calculated as the year fixed effects from a linear regression on the average markup by country with year and country fixed effects. The panel is fully balanced. LA countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, Venezuela. OECD (1990) corresponds to countries that belonged to the OECD in 1990. Rest of the world countries correspond to all countries in their sample that are not part of Latin America.

We argue that the inequality/market concentration relationship in Latin America is mediated by the somewhat bipolar nature of market structure in the region, characterized by the

[2] We include the unadjusted income distribution in Figure 3 for consistency with the rest of the discussion in this paper, which is based on reported income data from household surveys. Most Latin America household surveys don't explicitly ask for pre- or post-tax income, so corrections using tax data are based on the (probably correct) assumption that income reported is post-tax.

combination of highly concentrated rents in the upper end of the firm size distribution and much more extreme market fragmentation at the lower end than in advanced economies. Firms in the right tail of the revenue distribution hold large and entrenched power, and typically display more concentrated ownership than those in the developed world. At the other extreme, a plethora of tiny production units with very low productivity and very low income absorb a much higher share of the labor force than in rich economies.[3] The huge mass of people working in these businesses makes extremely precarious livelihoods.

Figure 3. Income distribution



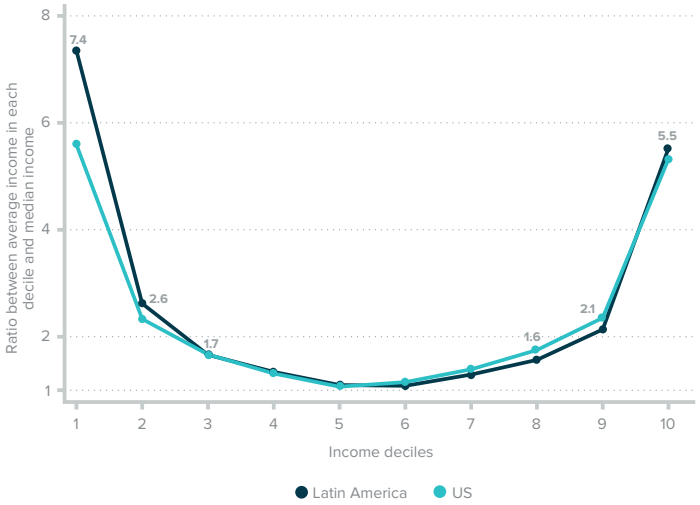
Sources: Pre-tax national income data from World Inequality Database (WID) 2020 for US, EU (Blanchet et al, 2020), and Latin America (De Rosa et al, 2021), own calculations. Weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay from national household surveys for Latin America.
Note: For WID: Pre-tax income by percentiles for adults over 20 years old with equal splits among spouses, excluding data below the 5th percentile where income is zero. For UNDP: total income for adults over 20 years old with equal splits among spouses. WID incomes for Latin America are adjusted to pre-tax values using administrative tax records to estimate effective tax rates at each income percentile (see De Rosa et al. 2020 for more detail), and using National Accounts. UNDP personal income excludes government transfers and occasional earnings.

We first document, in section 2, a close correlation between the size distribution of firms, which exhibits extreme fragmentation in the left tail and extreme concentration in the right, and inequality in the region. We also show that this pattern is not replicated in the US. In Latin America, the proportion of workers that work for or own a firm with more than 10 employees jumps from only 5% among workers in the bottom income quintile to over 52% in the top quintile. By contrast, in the US at least 70% of workers fall in this category in any quintile of the personal income distribution. The excess mass of Latin American low-income workers in tiny productive units with precarious income levels deepens inequality; it explains 34% of the larger D10/P50 income gap in the region vs. the US. For this exploration, we rely on household survey data on personal income for eleven Latin American countries and contrast it with census data for the US.[4] Given high (business and labor) informality in the region, the

[3] Many of these tiny businesses are family businesses where owners and workers are related and the distinction between profits and wages doesn't always make sense. This makes comparison of labor shares of income across regions imperfect.
[4] Most firms in LA have, in fact, five workers or less. We focus on the 10-employee threshold for comparability across countries and with international benchmarks.

types of administrative records used in developed economies to characterize inequality and business performance would yield a very incomplete picture for Latin America, precisely ignoring the massive left tail of both distributions for which the region stands out. This is why we use household level data, taking advantage of reports on the type of job that the individual has and the type of employer for which they work.

Figure 4. Ratio between the average income in each decile and median income



Sources: Authors calculations; national household surveys, Annual Social and Economic Supplement of the Consumer Population Survey (ASEC-CPC).

Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings. Pre-tax income data for the US and reported income data for Latin America may not be strictly comparable.

Section 3 then illustrates that the key role of employment in microenterprises and self-employment in inequality in the region is explained by the low relative productivity of most of these businesses. We do this mainly based on information on the characteristics of jobs held by individuals in the left tail of the income distribution, given the very limited availability of other performance measures for their employers. We show that productive units in the bottom end of the size distribution pay low wages and display other signs of extremely low productivity. It is the combination of the widespread presence of these units and the precariousness of their activities that explains, in an accounting sense, the high weight of extremely low livelihoods in the income distribution of the region.

Section 4 of the paper looks at the opposite end of the distribution of businesses (and incomes), for which data on revenue generation and costs exist. We document signs of a high concentration of income in capital rents that go into a few hands: markets and corporate ownership are highly concentrated, and the labor share of income is low. We also use microdata on manufacturing units with 10 or more employees, taken from official surveys and censuses for five Latin American countries, to document that the high concentration we observe has a root in the highly disperse distribution of productivity. If anything, the smaller manufacturing establishments (in these non-micro segments) are larger than would be expected given their underlying productivity. Still, manufacturing establishments that hold

the largest market shares operate with high markups and low labor shares that, together with their concentrated ownership, contribute to high inequality.

This paper relates to two different literatures. First, the extensive literature that explores concurrent falling labor shares, increasing market concentration and markups, and an increase in wealth and income at the very top of the distribution.[5] This story is not unchallenged. There is also evidence that there might be a reduction in market concentration at a local level (see Rossi-Hansberg et al., 2018 and Lanier et al.,2021), and that the common wisdom of an increase in concentration of markets in dominant firms in the US is a fiction caused by ignoring the global character of markets (Gutiérrez & Phillipon, 2020). We contribute to this debate by highlighting that the focus on huge fortunes provides a very partial look at the relationship between inequality and market structures for Latin America. In this region, among the most unequal in the world, the overwhelming presence of production units with tiny market shares and low productivity is closely associated with the overwhelming presence of precarious livelihoods, which is a distinctive characteristic of the distribution of personal income in the region.

Our work also relates to the literature on firm size and its relationship to development. This literature has shown that developing economies display a much fatter bottom tail of the firm size distribution than advanced economies (Bento & Restuccia, 2017, 2021; Eslava & Haltiwanger, 2021; Levy, 2018; Tybout, 2000). Much of this literature has relied on data for the manufacturing sector, and much of it covers only establishments with 10 or more employees. Self-employment (i.e., one-person productive units), is generally ignored. We provide an alternative look at this phenomenon by exploiting comprehensive information on firm sizes covering both formal and informal establishments and self-employment. The excess mass (relative to advanced economies) in the left tail of production unit size distribution is much more pronounced with this comprehensive characterization. This look at the data also allows us to illustrate that the size distribution of productive activities is not only closely related to the productivity deficit in the region, but also to its high level of inequality. The excess allocation of workers to smaller productive units in LA accounts for a sizable fraction of differences in inequality measures vis-à-vis the US, even holding relative income levels constant.

2. Inequality and the concentration-fragmentation dichotomy in Latin America

2.1. Data

We begin by characterizing concentration in the business sector in terms of the absorption of workers, including salaried workers, business owners, and the self-employed.[6] We then connect this concentration to personal income inequality. Focusing on workers rather than revenue

[5] Piketty and Goldhammer (2014), Piketty et al. (2017), Saez and Zucman (2020a), and Saez and Zucman (2020b) document an increase in wealth concentration and inequality from income data, particularly marked in the US and the UK. Autor et al. (2020) and Karabarbounis and Neiman (2013) find decreasing trends in labor share for the US and some European countries. De Loecker and Eeckhout (2018) and De Loecker et al. (2020) document a global increase in markups, although they do not find that same pattern for Latin America. Covarrubias et al. (2019) argue that increasing markups do not seem to be rooted in additional innovation or productivity.

[6] The unincorporated self-employed in US data.

or output allows us to provide a comprehensive view of the organization of business in Latin America, where much of the value generation—especially from the segment of small productive units—is unobserved.[7] Meanwhile, worker statistics are produced for all jobs and occupational categories, irrespective of the size of the productive unit where the person is an employee or owner, and of whether the activity is formal. While worker statistics are based on surveys of workers rather than firms, they do collect information on the employer or owned business, specifically its size and the remuneration the worker obtains from it. We thus concentrate on personal income for the worker population. In consonance with the data treatment protocols in the World Inequality Database, and given the low representativeness of the youngest workers in advanced economies' data, including the US, we exclude workers younger than 20.[8]

The data we use in this section for Latin America and the Caribbean comes from the 2019 harmonized household (employment) surveys for 9 different countries in the region: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, and Uruguay. Household surveys are administered by the national statistical agencies of these countries and subsequently harmonized by the Sustainable Development Goals (SDG) and the Development Policy team at the United Nations Development Programme (UNDP). Workers interviewed for these surveys report whether they are self-employed, salaried employees, or business owners. Salaried employees and owners report the size of the firm with which they are affiliated, expressed in a range for the number of workers. Our sample is restricted to workers who declare a positive income and to those in the private sector, excluding those who declare that they work in public administration or education.[9]

For the US, we use data from the 2019 Annual Social and Economic Supplement of the Consumer Population Survey (IPUMS ASEC-CPC). The survey establishes the proportion of self-employed workers vs. salaried workers and business owners and reports the size of the firms with which workers are affiliated.[10]

2.2. Market concentration and market fragmentation in Latin America

The last two columns of Table 1 show the employment-weighted size distribution of productive units in Latin America and the US. These columns report the fraction of workers who are self-employed vs. those associated with a firm (both employees and owners), the latter classified according to firm size. The most outstanding feature of the structure of production units in Latin America, captured in these numbers, is excess market fragmentation in the left tail of the distribution: there is an extreme prevalence of very small units. This has been widely documented in the firm size literature using firm-level data.[11] The observation is even starker if one considers

[7] Most small businesses, workers associated to them and most of the self-employed are absent from administrative records. This is one face of the widespread informality in the region.
[8] Excluding workers younger than 20 underestimates the activity in the lower tail of the business size distribution in LA, where participation in the labor market at ages between 15 and 20 is much higher than in the OECD countries.
[9] As a result, family workers, many in tiny family businesses, are excluded from this exercise because they are non-salaried and thus do not report personal income. Workers in private education are also excluded, as we cannot tell them apart from those in public education.
[10] In the US data, business owners are labeled as incorporated self-employed, while the unincorporated self-employed correspond to what in the LA data is identified as self-employment.
[11] E.g., Bento and Restuccia, 2021; Alfaro and Eslava, 2020; Eslava et al., 2021; Levy, 2018

the huge mass of self-employed individuals whose productive activities are not picked up in business statistics but *de facto* constitute one-person businesses relative to the US. Only 22% of US workers have jobs at firms with 10 or fewer employees, are self-employed, or own one such firm, frequently labeled as micro-enterprises in international firm size classifications, while the equivalent figure in Latin America is almost 70%. In fact, most of the Latin American workers in micro-enterprises (59%) are in productive units of four or fewer employees, even when family workers are excluded. These patterns are prevalent across Latin America, as shown in the remaining columns of Table 1, although starker in countries such as Bolivia and Mexico.

Table 2 shows that, of the 68% of workers in micro-enterprises in the region, 32% are self-employed, another 30% work at micro-firms, and an additional 6% own micro-sized businesses. The number of business owners (even excluding the self-employed) in Latin America doubles that of the US, a feature explained precisely by the high prevalence of microenterprise ownership. The Appendix, where Table 2 is reproduced for each country in our sample, shows that the prevalence of self-employment and micro enterprises is a constant across the region.

Large firms are still an important absorber of employment in the Latin America. Workers in firms of 101 or more workers represent over 20% of employment in several countries—substantially more in Brazil, Chile, and Uruguay, where most employment outside micro establishments falls in this category (see Table 1). However, this employment concentration in the larger firm size category is clearly less stark than in the US and other advanced economies, where the majority of workers are in these firms.

Table 1. Distribution of workers, %

Number of employees in firm	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	
Self employed	32	60	31	29	46	23	
1-4	28	19	24	17	20	25	
5-10	12	8	9	7	6	10	
11-100	17	12	11	16	11	25	
101 or more	11	1	25	33	17	18	
Number of employees in firm	**Dominican Republic**	**Mexico**	**Paraguay**	**Peru**	**Uruguay**	**LA**	**US**
Self employed	17	41	48	48	29	**32**	**7**
1-4	41	31	20	13	20	**27**	**15**
5-10	10	9	10	8	10	**9**	
11-100	20	14	11	17	16	**14**	**23**
101 or more	11	4	11	13	25	**18**	**56**

Sources: Authors' calculations; national household surveys, Annual Social and Economic Supplement of the Consumer Population Survey (ASEC-CPC).
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Firm size categories for the US correspond to 1-9, 10-100, and 101 or more.

In sum, the size distribution of productive units in Latin America reveals a combination of massive excess fragmentation of production in the extreme left tail and an additional mass in

large corporations, with a notable missing middle. These characteristics, widely recognized in the literature on firms, are even starker when the most atomic productive units are included. We now illustrate how these features, which mirror the outstanding characteristics of the region's income distribution, correlate with income inequality.

2.3. The joint business size-income distribution

Table 2 also points at the correspondence between the excess left skewness of the income and business size distributions in LA compared to the US. The proportion of workers associated, as employees or owners, with firms of over 10 employees jumps from only 5% among workers in the bottom income quintile of the income distribution to over 52% in the top quintile. Meanwhile, at least 69% of workers in all income quintiles are employed in non-micro firms in the US, with mild differences across these quintiles. Notice also that all non-micro owners in LA are among the richest 20%. This is in contrast with the US, where there are non-micro business owners in all income quintiles.

Table 2. Inequality and the size distribution of productive units: percentage of workers

	Panel A: Latin America						
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**P95**	**Total**
Self-employed	58	33	24	22	21	20	32
Micro employee	33	41	35	28	14	12	30
Non-micro employee	5	22	37	44	49	53	31
Micro owner	5	4	3	5	13	13	6
Non-micro owner	0	0	0	0	3	2	1
	Panel B: United States						
	Q1	**Q2**	**Q3**	**Q4**	**Q5**	**P95**	**Total**
Self-employed	11	6	6	6	5	6	7
Micro employee	18	16	11	9	6	7	12
Non-micro employee	68	75	79	81	80	76	77
Micro owner	2	2	2	3	5	6	3
Non-micro owner	1	1	1	2	4	5	2

Sources: Authors' calculations; national household surveys, Annual Social and Economic Supplement of the Consumer Population Survey (ASEC-CPC).
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. Including them would contribute to an even thicker left tail in the LA distribution. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings.

Much of the difference between the average Latin American country and the US is related to the prevalence of self-employment among poorer individuals in LA. In LA, being self-employed is three times as likely in the first quintile compared to the fifth one. The markedly decreasing likelihood of (unincorporated) self-employment along the income distribution in LA suggests a very different nature of entrepreneurship in the region compared to the US. Latin Americans end up in self-employment for lack of better opportunities and better human

capital endowments, rather than due to their entrepreneurial nature, as would be implied by a standard model of self-employment as an occupational choice. This is not replicated in the US, where self-employment is slightly U-shaped over income.

We quantify the role played by the differential allocation of workers across categories of Table 2, as opposed to income differentials between those categories, in explaining income inequality. To do this, we decompose the gap between the median of the income distribution and the average income of each income decile into the contribution of different worker categories, given the share of workers and the income gap in each of those categories. We then compare those contributions in Latin America and the US.

The average median-to-own income gap of the bottom decile of the income distribution (D1) can be written as:

$$\bar{y}_{D1} = \sum_{i \in D1}^{N_{D1}} \frac{y_i}{N_{D1}} = \sum_{j \in size} \frac{N_{j,D1}}{N_{D1}} \bar{y}_{j,D1} \quad (1)$$

where y_i is the ratio between the median of the income distribution and the income of individual *i*; N_{P10} is the number of individuals in the bottom decile; *size* is the set of the five worker categories that we consider—*self-employed, salaried in micro (i.e., up to 10 employees), micro owner, salaried non-micro, non-micro owner; j* is one such category; $\bar{y}_{j,D1} = \frac{\sum_{i \in j,D1} y_i}{N_{j,D1}}$ and $N_{j,D1}$ is the number of individuals in category *j* within the bottom decile.

The difference in $\bar{y}_{D1}$ between any Latin American country and the US depends on how workers in the bottom decile are distributed across worker categories with different median-to-own income ratios $\bar{y}_{j,D1}$:

$$\bar{y}_{D1,LA} - \bar{y}_{D1,USA} = \sum_{j \in size} \left(\frac{N_{j,D1LA}}{N_{D1LA}} \bar{y}_{j,D1LA} - \frac{N_{j,D1USA}}{N_{D1USA}} \bar{y}_{j,D1USA} \right) \quad (2)$$

The left panel of Table 3 summarizes these components for a weighted average of 11 LA economies, where countries are weighted according to their working population, and the US. The average income gap of the bottom decile with respect to the median, i.e., the P50/D1 gap, is 7.35 in LA and 5.59 in the US (31% larger in LA). A much larger contribution by the categories of self- employed and individuals in micro firms in LA partially explains the 1.76-point difference between the two regions. By contrast, in the US the largest concentration of workers in the bottom decile (and along the whole income distribution) occurs in the category of employees in non-micro businesses, which in fact exhibits a more muted income gap than other categories with respect to median income. That is, while in Latin America workers in the bottom decile concentrate in the largest income gap categories, the opposite is true in the US.

Table 3. Components of the decomposition of personal income inequality in the lowest and highest income deciles in LA and USA 2019: Workers

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
	Latin America					
Self employed	63 %	7.85	4.94	20 %	4.74	0.95
Micro salaried	29 %	6.40	1.85	10 %	4.14	0.40
Nonmicro salaried	3 %	6.15	0.18	49 %	5.29	2.60
Micro owner	5 %	7.29	0.38	16 %	6.05	0.99
Nonmicro owner	0 %	-	-	5 %	12.39	0.57
Total	**100 %**	**6.92**	**7.35**	**100 %**	**6.52**	**5.52**
	United States					
Self employed	13 %	6.00	0.79	5 %	5.82	0.30
Micro salaried	19 %	5.62	1.05	6 %	5.98	0.38
Nonmicro salaried	65 %	5.48	3.57	78 %	5.13	4.00
Micro owner	2 %	5.99	0.14	6 %	5.97	0.35
Nonmicro owner	1 %	6.20	0.04	4 %	6.39	0.28
Total	**100 %**	**5.86**	**5.59**	**100 %**	**5.86**	**5.32**
	Latin America - United States					
Self employed	50 %	1.86	4.14	15 %	-1.08	0.65
Micro salaried	10 %	0.77	0.80	3 %	-1.84	0.02
Nonmicro salaried	-62 %	0.67	-3.39	-29 %	0.17	-1.40
Micro owner	3 %	1.30	0.24	11 %	0.08	0.64
Nonmicro owner	-1 %	-	-	0 %	6.01	0.29
Total	**-**	**1.15**	**1.76**	**-**	**0.67**	**0.20**

Sources: Authors' calculations; national household surveys, Annual Social and Economic Supplement of the Consumer Population Survey (ASEC-CPC).

Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings.

This result is summarized by decomposing the average income gap in the first decile of each region into a within- and a between- worker category components:

$$\bar{y}_{D1} = \underbrace{\frac{\sum_{j \in size} \bar{y}_{j,D1}}{5}}_{within} + \underbrace{\sum_{j \in size} \left(\bar{y}_{j,D1} - \frac{\sum_{j \in size} \bar{y}_{j,D1}}{5} \right) \left(\frac{N_{j,D1}}{N_{D1}} - \frac{\sum_{j \in size} \frac{N_{j,D1}}{N_{D1}}}{5} \right)}_{reallocation}$$

The between, or reallocation, component captures the degree to which the category-level income gap covaries with the share of workers absorbed by the different categories, while the within component is the average gap across categories. The reallocation component is positive if workers concentrate in large income-gap categories, and larger if that relationship is tighter.

The bottom panel of Table 3 indicates that about 66% of the 1.76-point difference between the two regions (1.15 points) is explained by a larger average income gap across categories in LA, while the remaining 34% comes from the larger concentration of workers in the worst paid of these categories in LA relative to the US.

At the opposite end of the income distribution, the top decile, income gaps with respect to the median are again larger in LA than the US in all worker categories (right panel of Table 3). The top decile's average income gap is 0.20 points larger in LA than in the US. Business owners contribute the most to that distance. For larger business owners—the richer among the rich—the average own-to-median income ratio doubles that of the US. We further investigate the potential origins of this particularly large income gap for top firm owners in section 4, where we explore the role of large firms in generating capital gains.

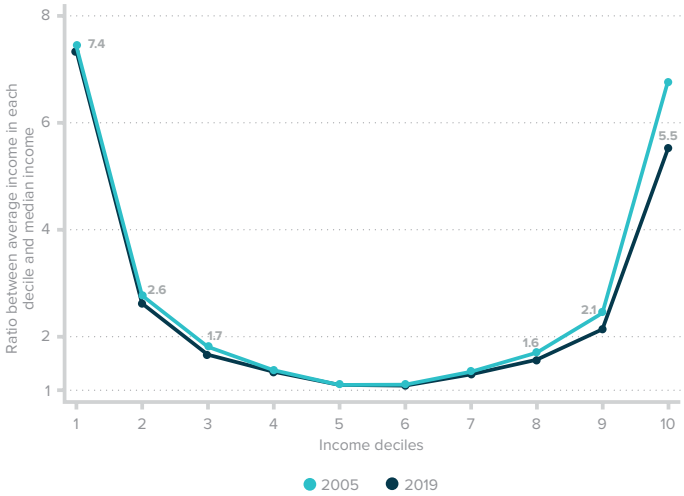
While reallocation alone could represent a big difference for workers at the bottom tail of the income distribution in terms of their distance to the median, reducing inequality at the top seems impossible without income changes in absolute terms. If the allocation of workers across categories in LA is set to that of the US, but income gaps remain unchanged, the difference between the LA and US average income gaps of deciles 1 and 10 would be 0.82 and 0.23 points respectively, compared to 1.76 and 0.20 in the actual numbers. Meanwhile, own-to-median income ratios play an important role at both ends: if they are set to the US levels for any worker category in LA, while worker allocation across categories remains at its actual level, the distance between the LA and US average income gaps of deciles 1 and 10 is much smaller: only 0.28 points and 0.22 points respectively.

It is also useful to examine the contribution of allocation across worker categories vs. average income in each of them to the over-time evolution of inequality. Figure 5 shows a mild decrease in inequality between 2005 and 2019, which is driven mostly by the D10/P50 income gap.

Restricting our attention to personal income (vs. household income) and the universe of workers, Table 4 shows that the D10/P50 gap falls from 6.79 to 5.52 (1.27 points) between 2005 and 2019. It also indicates that this change is driven by reductions in the D10/P50 personal income gap for all occupational categories and employer sizes. Reallocation from self-employment and micro-firm ownership towards the non-micro salaried category has in fact played a moderating role in the reduction of the D10/P50 income gap. In absence of this reallocation, we would have observed a larger fall in the D10/P50 income gap, of 1.37 points (0.10 points over the total decrease of 1.27). In contrast, the P50/D1 personal income

gap decreases from 7.44 to 7.35 (0.09 points) and reallocation from self-employment and non-micro salaried towards the micro owner and micro salaried categories reduced the fall in the gap by 0.04 points, which contributes to 44%of this observed decrease.

Figure 5. Decennial shifts in the income distribution, Latin America



Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019, except for Chile (2017) and Mexico (2018), and 2005, except for Chile (2003), Uruguay (2006) and Colombia (2007). The figure shows the distance between the average income in each percentile and the average income in the 50th percentile just as in Figure 4.

Back to the current level of inequality, the following two sections, respectively, take a more in-depth look at the lower and upper tails of the firm size distribution, highlighting the characteristics of those groups that explain their income gaps with respect to the median. We focus on low productivity for small, fragmented productive units and high concentration and markups for the large ones.

Table 4. Components of the decomposition of personal income inequality in the lowest and highest income deciles in LA 2005 vs 2019: Workers

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			2005			
Self employed	0.67	7.93	5.33	0.22	5.91	1.32
Micro salaried	0.26	6.35	1.62	0.09	5.17	0.45
Nonmicro salaried	0.05	6.17	0.30	0.48	6.50	3.09
Micro owner	0.02	7.77	0.19	0.17	7.59	1.28
Nonmicro owner	0.00	-	-	0.05	14.32	0.65
Total	**1.00**	**7.05**	**7.44**	**1.00**	**7.90**	**6.79**
			2019			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			2019-2005			
Self employed	-0.04	-0.08	-0.40	-0.02	-1.17	-0.37
Micro salaried	0.03	0.05	0.23	0.01	-1.03	-0.04
Nonmicro salaried	-0.02	-0.01	-0.11	0.01	-1.20	-0.49
Micro owner	0.03	-0.48	0.19	-0.00	-1.54	-0.29
Nonmicro owner	0.00	-	-	0.00	-1.92	-0.07
Total	**-0.00**	**-0.13**	**-0.09**	**0.00**	**-1.37**	**-1.27**

Sources: Authors' calculations; national household surveys, Annual Social and Economic Supplement of the Consumer Population Survey (ASEC-CPC).

Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019, except for Chile (2017) and Mexico (2018), and 2005, except for Chile (2003), Uruguay (2006) and Colombia (2007). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings.

2.4. Market fragmentation, low productivity, and the left tail of the income distribution

In this section we concentrate on the thick left tail of the income distribution in the region, and its roots in the characteristics of the business sector.

The previous section documented that not only is the massive left tail of the income distribution mirrored by left skewness in the firm size distribution, but also that low-income individuals tend to disproportionately work in businesses located in the left tail of the firm size distribution by comparison to the US. This section documents that this segment of the firm distribution is characterized by extremely low productivity, which is in the end the explanation for precarious incomes for those whose livelihoods depend on these activities, regardless of whether they are workers or firm owners.

Table 5 presents evidence of productivity gaps between micro establishments (including one-person establishments) and larger firms for Mexico, where a recurrent Economic Census allows for comparison of the full distribution of sizes in manufacturing, services, and commerce. We build these figures based on TFP calculations reported by Levy (2018) for different size bins, based in turn on the 2013 Mexican Economic Census.[12] Micro establishments, defined as those of up to 10 workers, exhibit a huge productivity gap of 31 log points relative to establishments within the 11-50 workers range, and of 37 log points relative to those with over 50 workers.

Table 5. Total factor productivity in Mexican establishments of different sizes

Firm size	Average TFP
1-10 employees	0.103
11-50 employees	0.412
51+ employees	0.472

Note: Total factor productivity calculations based on Table 4.5 of Levy (2018) using data from the economic census for the year 2013. Original firm categories include fully formal, mixed, informal but legal, and informal but illegal with aggregations from 1-5, 6-10, 11-50 and 50+ employees. Average TFP is calculated as the weighted average across those categories.

The rules for inclusion of establishments in the Mexican Economic Census leave out what is arguably a very sizable fraction of self-employment: mobile establishments, rural activities, and all activities that occur in municipalities of less than 2,500 inhabitants.[13] To get a more comprehensive sense of the degree to which productivity differs for the self-employed vs. those in employer establishments of different sizes, Table 6 presents statistics from household surveys for 11 LA countries in 2019 on proxies of productivity for the productive unit with which the individual is associated. We report average wage and the prevalence of informality, defined by the absence of contributions to the pension system.[14]

[12] The TFP level that we report for a given size bin corresponds to a weighted average of TFP levels of different subgroups within that size bin. Levy (2018) estimates and reports TFP for those subgroups, together with their weights in the overall population of establishments and workers (Table 4.5).
[13] In fact, Levy (2018) estimates that the Census only captures about 44% of total employment.
[14] Social insurance systems across the region require workers to contribute a fraction of their labor income to pension savings. Informal workers are defined as those who do not make contributions and hence, are not insured under a contributory system.

Table 6 shows a clear ranking: workers earn higher wages and face a lower probability of informality as we move up the ladder of firm size categories. The average wage of self-employed individuals is 77% of the overall average wage. Among salaried workers, the figure starts at 68% for workers in firms of at most 4 workers and increases with firm size reaching 163% for those in firms of 100+ workers. Formality rates increase from just 7% for the self-employed to 20% for workers in establishments of at most 4 workers, and then increase with firm size reaching 87% for workers in firms of 100+ workers.[15]

Table 6. Average labor income, informality, and years of schooling by worker type and firm size in LA, excluding business owners

	Employment categories	Fraction of employment	Average wage in category relative to overall average wage	Fraction that are formal workers	Mean years of schooling
	Self-employed	34 %	77 %	7 %	8.6
Salaried workers	**1-4**	24 %	68 %	20 %	8.9
	5-10	9 %	97 %	41 %	10.3
	11-100	14 %	125 %	69 %	11.3
	101 or more	19 %	163 %	87 %	12.1
	All	100 %	100 %	32 %	9.7

Sources: Authors calculations; national household surveys.

Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay except for informality which excludes Argentina and Costa Rica. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings. Informality defined as workers that do not contribute to pension funds.

These numbers illustrate the fact that the economic activity in micro-businesses and self-employment exhibits extremely low relative productivity. Together with the fact that these activities employ a much larger fraction of the labor force than similar activities in benchmark economies, low productivity explains why such a large mass of Latin Americans earn so little relative to the income of non-micro owners which, as seen, is central to understanding income inequality in LA. While self-employed workers and workers in the smallest firms are on average less educated than others, and average schooling increases with firm size, Table 7 shows that salaried workers' wages increase with firm size and the self-employed do worse than most salaried workers in all schooling categories.[16]

[15] See Table A1 in the appendix for precise size categories across countries.
[16] Self-employed workers with secondary or tertiary education do better than peers in the same attainment category who work in firms of less than 5 employees. This is the only exception.

Table 7. Average labor income, informality and years of schooling by worker type and firm size in LA, excluding business owners

Employment categories		Fraction of employment	Average wage in category relative to overall average wage	Fraction that are formal workers
Primary or less	Self-employed	19 %	57 %	4 %
	1-4	14 %	61 %	16 %
	5-10	4 %	81 %	30 %
	11-100	5 %	95 %	55 %
	101 or more	5 %	109 %	83 %
Secondary	Self-employed	11 %	80 %	8 %
	1-4	8 %	71 %	22 %
	5-10	3 %	94 %	43 %
	11-100	6 %	111 %	69 %
	101 or more	9 %	125 %	86 %
Tertiary	Self-employed	5 %	153 %	23 %
	1-4	2 %	116 %	36 %
	5-10	1 %	151 %	61 %
	11-100	3 %	200 %	81 %
	101 or more	5 %	279 %	90 %
	All	**100 %**	**100 %**	**32 %**

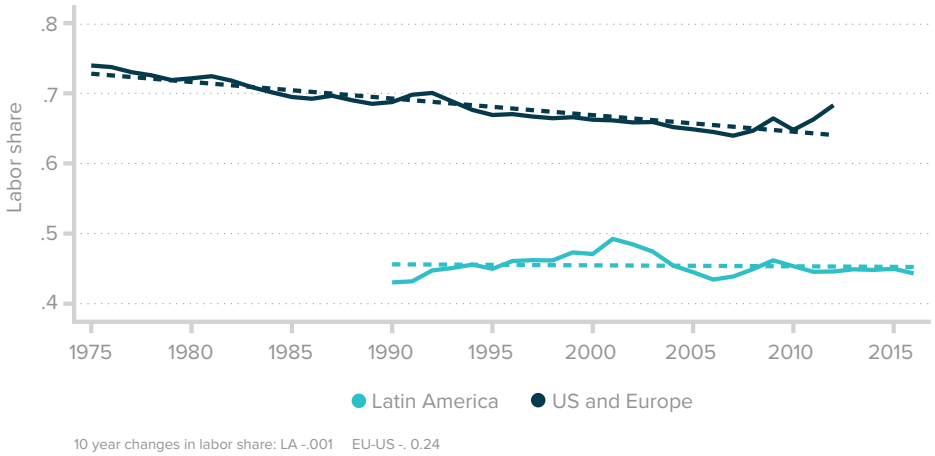
Sources: Authors calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay except for informality which excludes Argentina and Costa Rica. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings. Informality defined as workers that do not contribute to pension funds.

Market concentration and the right tail of the income distribution

At the other end of the income distribution, a small number of individuals have high income levels that allow them to hold a large fraction of the total income in the region. To what extent are such high-income levels a reflection of high market power and rents? The upper panel of Figure 6 shows that the labor share in the region is much lower than in advanced economies, and we have seen in Figure 2, above, that markups have been historically much higher than in other latitudes and remain extremely high.[17]

[17] In cross country growth regressions of GDP growth vs. investment and the growth of labor, De Gregorio (1992) finds a much lower labor coefficient of around 0.4 compared to usual coefficients of around 0.7 for advanced economies, providing evidence from a different angle of the much lower labor share in Latin America. Those numbers are very similar to what is shown in the top panel of Figure 5 based on National Accounts data.

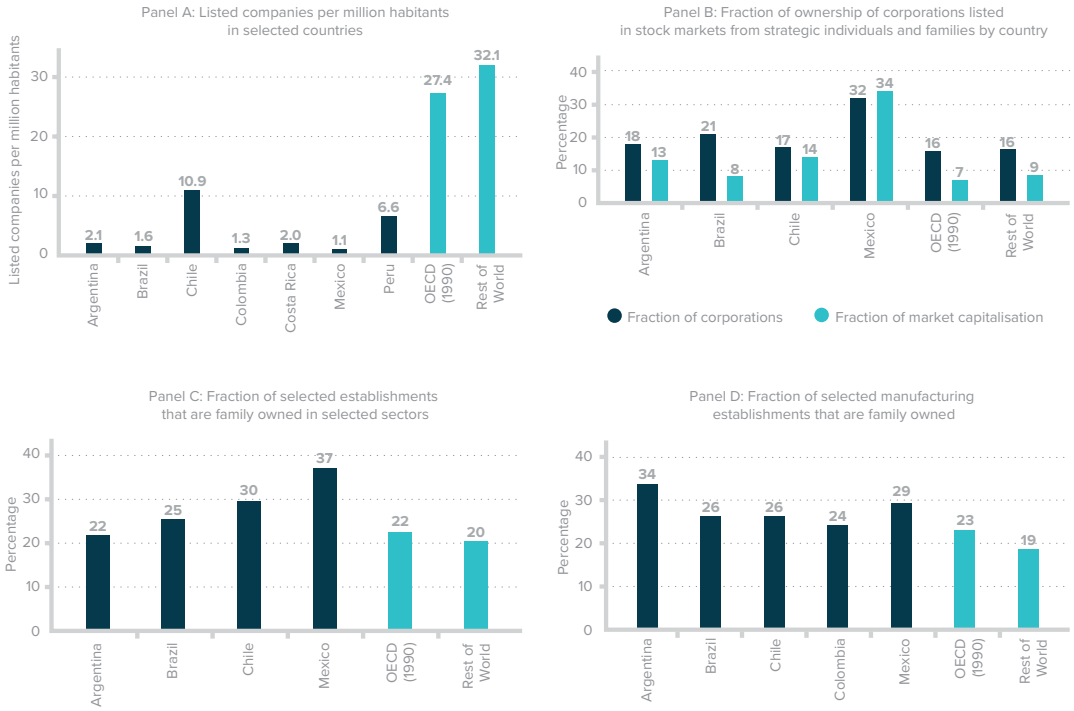
Figure 6. Labor shares in Latin America and other regions



Note: Average labor share by year calculated as the year fixed effects from a linear regression on the labor share with year and country fixed effects. Data obtained for Europe and US from EU KLEMS 2012 release obtained from Autor et al. (2019), and LA KLEMS 2020 release for Latin America. For all countries, labor share is defined as the labor compensation over value added. Some countries in the EU enter the sample at different periods, all countries in LA are available since 1990 through 2016. Europe countries: Austria, Belgium, Finland, France, Germany, Italy, Japan, the Netherlands, Russia, Spain, Sweden, and the UK. LA countries: Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Honduras, Mexico, and Peru.

Not only are average markups extremely high and only a relatively small fraction of earnings shared with workers, but rents are also distributed among a smaller number of shareholders. Figure 7 illustrates different manifestations of the fact that business ownership is more concentrated in the region than in the rest of the world. Panel A shows that the normalized number of companies listed in the stock market is much smaller in Latin American countries than the rest of the world. If we take participation in the stock market as a proxy for disperse ownership, this is a manifestation that ownership in LA is highly concentrated. In addition, as panel B shows, even for listed companies, ownership is more concentrated in controlling shareholders in the region vs. comparison countries. Family ownership is also more prevalent in the region, as illustrated in panels C and D based on survey data for listed and non-listed companies from Bloom, Sadun & Van Reenen (2012, 2015). This also holds true among the largest firms, with family-owned firms' revenues representing a sizable share of GDP in some of the larger countries (see Schneider, 2021). These are signs that excessive market concentration may be adding insult on the high end of the income distribution to the injury inflicted by the excessive allocation of workers to a host of low productivity and low-wage productive units.

Figure 7. Concentration of firm ownership



Note: OECD (1990) refers to countries that were part of the OECD by 1990. Strategic individuals and families refer to persons that are either controlling owners or members of a controlling family or block-holders and family offices. Sources: WDI for 2018 or the closest year available in Panel A; De La Cruz, Medina, & Yang (2019) for Panel B, reporting data based on the 10,000 largest listed companies across the world; Bloom, Sadun & Van Reenen (2012) for Panel C; Bloom, Sadun & Van Reenen (2015) for Panel D.

Whether high market concentration is good or bad per se, both in general and in terms of its impact on inequality, is an open question at a global scale. The answer depends on several, interrelated factors, and on how they interact with each other (see e.g., Covarrubias et al. 2019): first, the extent to which market concentration translates into high market power (and prices higher than would arise in its absence), and second, if that is the case, the extent to which market concentration ends up representing high rents in the hands of a few shareholders, rather than rents more widely distributed among multiple owners, workers, and providers. Lastly, it depends on the extent to which market concentration results from anti-competitive behavior and market power abuse. Market concentration may also result from high productivity, high innovation, or high endogenous barriers to entry with origin in the shape of cost functions—regulated natural monopolies represent a large share of concentrated markets. The evidence for the US suggests that market concentration is not black or white, but a shade of grey resulting from the combination of "good" and "bad" effects: lower labor shares, but also higher productivity and innovation and not necessarily higher (quality-adjusted) price in markets with greater concentration (e.g., Ganapati, 2020).

This section investigates these issues for Latin America, taking advantage of detailed survey data for non-micro manufacturing establishments. The manufacturing sector represents less than 20% of economic activity and employment in the region. Still, it is a useful laboratory to understand these issues thanks to the availability of establishment-level data for firms of small to large sizes (unlike what is usually available for other industries).

2.5. Data and measurement

We apply distributed microdata analysis, a method initially developed by Bartelsman et al. (2013), to conduct consistent cross-country analysis based on microdata collected separately for different countries. With the support of country experts,[18] we work with surveys of the manufacturing sector conducted by the official statistical bureaus of Chile, Colombia, Ecuador, Mexico, and Uruguay. We produce a series of comparable statistics on the distribution and evolution of markups, market concentration, productivity, and labor shares. The focus on the manufacturing sector is dictated by data availability.

We use data from the annual manufacturing surveys of these countries.[19] We classify establishments into three-digit sectors of the ISIC revision 4 classification (revision 3 for Chile).[20] To harmonize data from all sources, we restrict our analysis to establishments with at least 10 employees. The Chilean and Colombian surveys are effectively censuses of establishments with at least 10 employees or revenue above a certain threshold. The Ecuadorian survey covers establishments with at least 10 employees or revenue above 50,000 USD with a sampling procedure. In Uruguay, the survey is a census for establishments with at least 50 employees and there is sampling for establishments with 5-49 employees. Mexico's survey has a more complicated sampling procedure intended to be representative of economic activity, covering 99.3% of all manufacturing revenue and 96.6% of manufacturing employment.[21]

We use establishment level information on revenue, the capital stock, the value of material inputs, the number of employees, and the average wage calculated as total payroll divided by number of workers. With this information, we obtain measures of productivity and markups.

We calculate TFPR as a revenue residual from a Cobb Douglas gross output value production function with materials, labor, and capital as inputs:

$$R_{it} = TFPR_{it} L_{it}^{\alpha} K_{it}^{\beta} M_{it}^{\phi}$$

where R_{it} is i's revenue, and L, K, M refer to labor, capital, and materials, respectively. We use sector-specific factor elasticities estimated by Eslava & Haltiwanger (2021) on the Colombian data at the three-digit level of aggregation of the revision 3 of ISIC.

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[18] We are grateful for collaboration from Alejandro Castañeda (México), Nestor Gandelman (Uruguay), Alvaro García-Marín (Chile) and Vanessa Carrión (Ecuador), who processed the data for the respective country according to confidentiality requirements of each dataset.

[19] Chile: 2000-2015 from Encuesta Nacional Industrial Anual. Colombia: 1997-2016 from Encuesta Annual Manufacturera. Ecuador: 2016-2017 from Encuesta de Manufactura y Minería. Mexico: 2009-2016 from Encuesta Annual de la Industria Manufacturera. Uruguay: 2002-2016 Encuesta Anual de Actividad Económica. The Ecuadorian survey includes mining, and the Uruguayan data includes other non-manufacturing sectors. We work with manufacturing data only for consistency across countries. We planned to include Brazil in our sample but the data on site work with the data, required by confidentiality restrictions, was not allowed during the pandemic.

[20] Chile, Colombia, Ecuador, and Uruguay use ISIC classifications, revision 3 for Chile and revision 4 for the other countries. Mexico classifies sector following the NAICS-Mexico at the 4-digit level which gives a similar disaggregation to the 3-digit ISIC revision 4 with 85 different manufacturing sectors.

[21] Out of 239 sectors following a 6-digit NAICS-Mexico code, there is a non-probabilistic sampling in 235 of them. In those sectors, establishments are included in the sample until a certain share of the aggregate activity is covered, with this share varying across sectors. 171 sectors require an 80% revenue threshold, 48 sectors require a 60% revenue threshold, and the remaining 16 sectors are allowed a threshold below 60%.

TFPR is a measure of productivity that captures both technical efficiency and price variability (Foster et al. 2008). It therefore combines technical efficiency with other determinants of output prices, including output quality, taxes on revenue and other output distortions, input market distortions, and in general idiosyncratic markups and their underlying explanations (see Eslava & Haltiwanger, 2021, Hsieh & Klenow, 2009). Because we lack information on output prices, we are unable to directly decompose these ingredients, but follow Hsieh & Klenow (2009) to estimate a composite distortion-free measure that combines technical efficiency and quality, under the assumption of CES demand. We label this measure TFPQ_HK (as in Eslava & Haltiwanger, 2021) and calculate it as

$$TFPQ\_HK = \frac{R_{it}^{\frac{1}{1-\frac{1}{\sigma}}}}{L_{it}^{\alpha} K_{it}^{\beta} M_{it}^{\phi}}$$

where is the elasticity of substitution, for which we use the sector-specific estimates of Eslava & Haltiwanger (2021) on the Colombian data. See the measurement appendix for greater detail.

We also calculate a reduced-form markup following De Loecker et al. (2018, 2020), as

$$\mu_{it}^{DL} = \frac{\alpha + \phi}{\frac{w_{it} L_{it} + Pm_{it} M_{it}}{Q_{it} * P_{it}}}$$

where the denominator is the revenue share of the two variable inputs, materials, and labor. As De Loecker et al. (2018, 2020) show, in absence of market power in input markets this expression is equivalent to the ratio of price to marginal cost.

The De Loecker markup is unadjusted for the presence of distortions to the optimal size of businesses (Eslava & Haltiwanger, 2021). We thus refer to it as the "pre-distortion markup" when presenting our results. Since these business size distortions may have crucial implications for the distribution of income, as we have already pointed, we also produce a structural measure of distortion-adjusted markups. Maintaining the assumption of CES demand and allowing for Cournot competition, the distortion-adjusted markup is given by

$$\mu_{it}^{S} = \frac{\sigma}{(\sigma - 1)\left(1 - \frac{R_{it}}{\sum_{i \in sector} R_{it}}\right)}$$

In the measurement appendix we provide derivations for both forms of markups based on Eslava & Haltiwanger (2021). We also show that the relationship between both markups is mediated by a "revenue distortion" , equivalent to an implicit establishment-specific tax on *i*'s revenue:

$$\mu_{it}^{DL} = \frac{\mu_{it}^{S}}{1 - \tau_{it}}$$

$(1 - \tau_{it})$ is estimated structurally as a residual that explains the gap between the actual revenue of the establishment and that which would be predicted by the model given the

establishment's TFPQ_HK. $(1-\tau_{it})>1$ reveals an implicit subsidy: the establishment is larger than its total factor productivity would predict. $(1-\tau_{it})<1$ reveals the opposite.

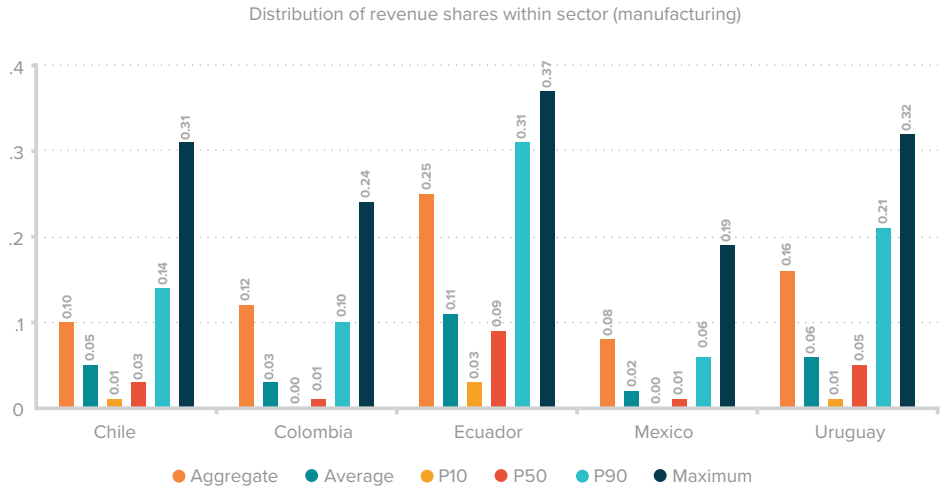
To help with the interpretation, notice that, under the characterization of distortions as taxes on revenue, μ_{it}^{DL} is the pre-tax markup while μ_{it}^{L} is tax-adjusted. It is useful to keep in mind that, by definition, in the absence of market power in the input markets $\mu_{it}^{DL}=\frac{P_{it}}{Mgcost_{it}}$ while $\mu_{it}^{S}=\frac{P_{it}*(1-\tau_{it})}{Mgcost_{it}}$. The structural markup is the markup that should be perceived by the establishment to rationalize its size through the lens of the model, and in that sense, it reveals a price to cost margin where the price is inclusive of the distortions perceived by the firm. (It will also be useful for interpretation to remember that, in the presence of market power in input markets, $\mu_{it}^{DL}=\frac{\frac{P_{it}}{Mgcost_{it}}}{Markdown_{it}}$ and $\mu_{it}^{S}=\frac{\frac{P_{it}*(1-\tau_{it})}{Mgcost_{it}}}{Markdown_{it}}$. See appendix.)

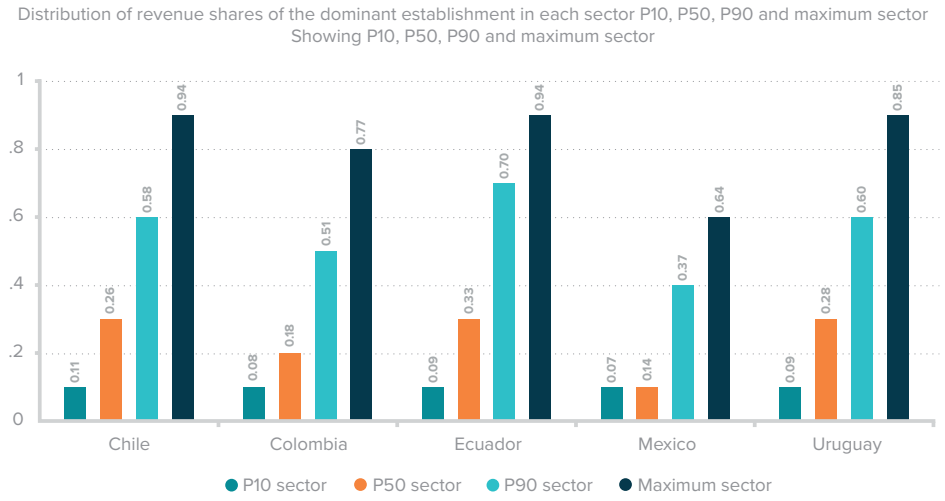
2.6. Results

We begin with a basic description of the patterns of market concentration, markups, and productivity in our data. We then characterize the relationship between market concentration, markups, productivity, and the labor share.

Latin America is not an exception to the empirical regularity that a few dominant firms have a large revenue weight in many manufacturing sectors (e.g., Hottman, Redding & Weinstein, 2016, based on scanner code data). As the top panel of Figure 8 shows, the average (3-digit) sector has an establishment that absorbs 20% or more of the market. In the most concentrated sector, the dominant establishment represents over 60% of the total revenue (bottom panel). The median sector has an establishment that absorbs at least 14% of the total revenue.

Figure 8. Distribution of revenue shares within sector (manufacturing)

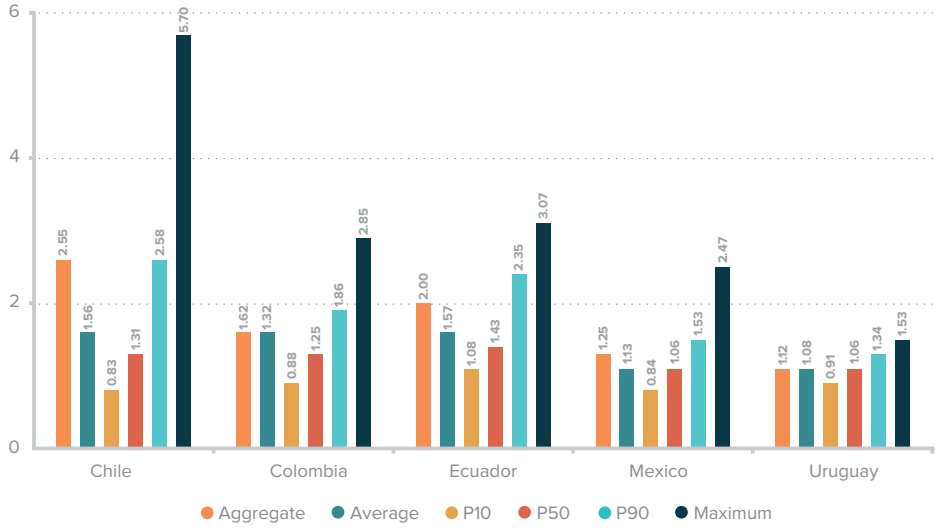




Note: Panel A. Distribution of revenue shares within sector, then plotting the average sector for each percentile of the distribution Panel B. Largest revenue shares within sector, then obtaining the P10, P50, P90 and maximum sector and plotting the average across years. For both panels. Sector defined as 3-digit ISIC rev. 4 with exception of Chile which has revision 3 and Mexico with NAICS at 4 digits. Number of sectors vary by country: Ecuador has the least number of sectors with 44 while Mexico has the most with 85. Data from Annual Manufacturing Surveys for each country. Surveys are limited to establishments with at least 10 employees. Data for Uruguay in 2006 dropped because of sampling issues in the survey.

The wide distance between the dominant establishment and the rest is reflected in the distribution of pre-distortion (i.e., De-Loecker) markups (Figure 9). While in the average sector the median markup ranges from 1.06-1.08 in Ecuador, Mexico, and Uruguay to 1.31 in Chile, the markup of the dominant firm more than doubles that number in all countries but Uruguay. Dominant firms play a particularly important role in Chile, as we will see throughout results in this section. The dominant role of the largest firm is more moderate in Uruguay.

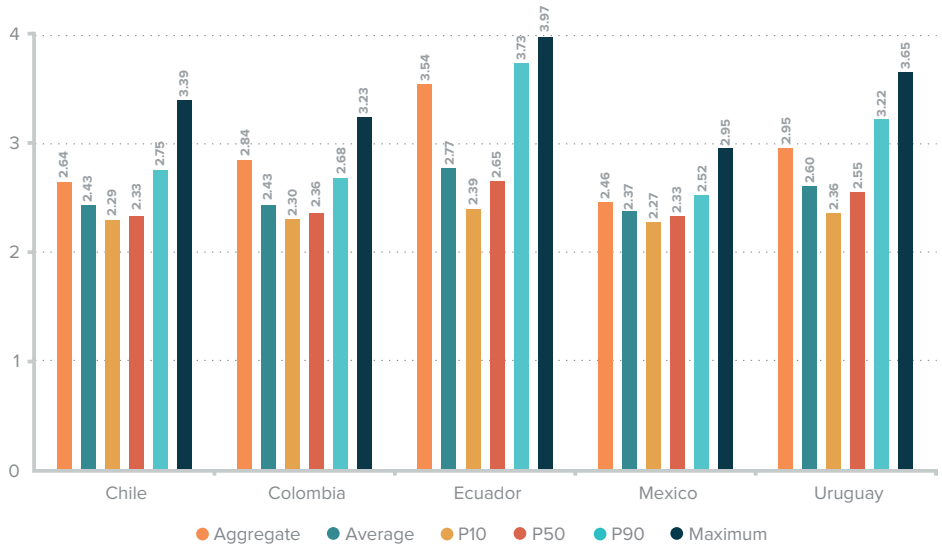
Figure 9. Distribution of pre-distortion markups in average sector



The gaps between the markup of the dominant firm and others become smaller once distortions are considered (Figure 10). The distortion-adjusted markup of the dominant

establishment is still considerably larger than the median one, but rather than being many-fold that median number, it is between 26% (Mexico) and 49% (Ecuador) higher. The moderating role of distortions comes mainly from a larger distortion-adjusted markup for establishments in the bottom tail of the size distribution (relative to establishments in the upper tail). That is, the business environment is such that these establishments reach a size above what their productivity would imply. The literature is vast, indicating that, even in the group of non-micro manufacturing establishments, relatively low productivity establishments in Latin America absorb too many productive resources.[22] These findings are aligned with that view.

Figure 10. Distribution of structural markup in average sector



Paradoxically, relative to what would be implied by underlying productivity levels, the share of activity concentrated at the very top of the firm size distribution could be sub-optimally *low* in Latin America. This suggests that a virtuous moderation of market concentration in the region requires an important productivity catchup by the mass of establishments outside the very top of the productivity distribution, simultaneously involving investments that shift the middle of the productivity and size distribution to the right, and more effective selection of low productivity activities out of the market.

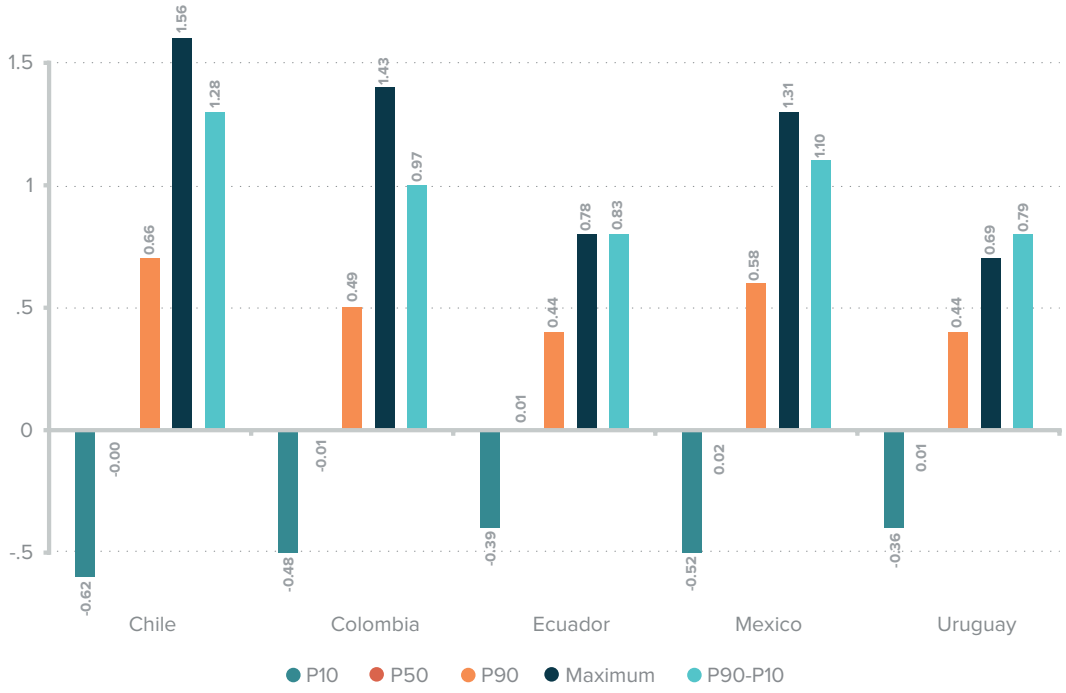
The TFPR distribution across manufacturing establishments also reflects a highly distorted environment, as has been well established in the literature on misallocation in Latin America. TFPR dispersion reveals the presence of distortions (Hsieh & Klenow, 2009), some of which may derive from imperfect competition in input markets, misspecification, and variable markups (Eslava &Haltiwanger, 2021). While TFPR dispersion is prevalent, it has been shown to be larger in less developed economies. The 90th percentile establishment in a manufacturing sector in the US has a TFPR that is 1.92 times that of the 10th percentile establishment (Syverson, 2011). Our data show a corresponding factor of between 2.2 (Uruguay) and 3.6 (Chile), as seen in Figure 11.

To further investigate the relationship between market concentration, markups, productivity, and labor shares, we follow Ganapati (2021). We reproduce, using our data for Latin American manufacturing establishments, Ganapati's analysis of the correlation between changes in

[22] Pagés 2010; Hsieh & Klenow, 2009; Eslava et al. 2013; Eslava & Haltiwanger, 2021.

market concentration and these other dimensions at a sector level in the US.[23] Although we lack access to sector level prices, the richness of the manufacturing data and the structure we imposed on it allow us to get at the gap between revenue and quantity productivity, as well as the gap between pre-distortion markups and structural markups.

Figure 11. Distribution of TFPR in average sector relative to average firm



Results are presented in Figures 12 through 14, which report the correlation between one-year changes in a sector's Herfindahl Index and (log) markups (structural and pre-distortion), TFPR, TFPQ_HK and the labor share, defined as the ratio of payroll to value added. While Figure 12 reports aggregate productivity, markup and labor share, built as the sales-weighted average across establishments, Figures 13 and 14 report the same dimensions for the sector's average establishment and the sector's dominant establishment, respectively. Results are similar if based on five-year rather than one-year changes.

An increase in sector concentration is mirrored by marked increases in the aggregate structural markup, pulled by the structural markup of the dominant firm, while the average structural markup barely changes. To some extent this occurs by construction, as the Herfindahl Index is particularly affected by the market position of the most dominant firms and the structural markup is the markup revealed by the establishment's revenue position in the sector. It is interesting to see that this strong association is not present when comparing market concentration and pre-distortion (aggregate or dominant) markups, implying that higher concentration does not necessarily translate into higher price to cost margins, even

[23] The richness of US data allows Ganapati (2021) to define markets at a very disaggregate level (industry-zip code markets). The data available for LA do not allow for a similar disaggregation level. Our markets are industry level markets defined at the national level. Because of the productive structure of LA economies, however, relevant markets are rarely national in scope and the estimations we present may often be capturing the story of narrower geographical markets.

considering only dominant firms (Mexico is an exception). Instead, average pre-distortions markups slightly fall as concentration increases, which together with the fact that this variable does not fall for the aggregate and the dominant firm, reveals some downward pressure on the lower end of the distribution. In fact, greater market concentration appears to be highly correlated with productivity gains in dominant businesses. While this seems to be good news in terms of the welfare implications of market concentration, it coexists with a negative correlation between market concentration and labor shares (as in Barkai, 2020), implying that the larger revenue of the dominant establishments remains mostly in the hands of business owners. Also, keep in mind that these findings refer to changes in market concentration. If concentration and markups are already high at the baseline, a further hike of markups and prices as a result of higher concentration may be contained by the demand.

Overall, this analysis reveals that market concentration in the region (at least in manufacturing) is indeed a source of income concentration, derived from the concentration of capital rents at dominant firms. On the other hand, dominant firms are also the ones with highest productivity.

Figure 12. Good vs. bad market concentration
Sector level changes in market concentration vs. changes in the following aggregate variables

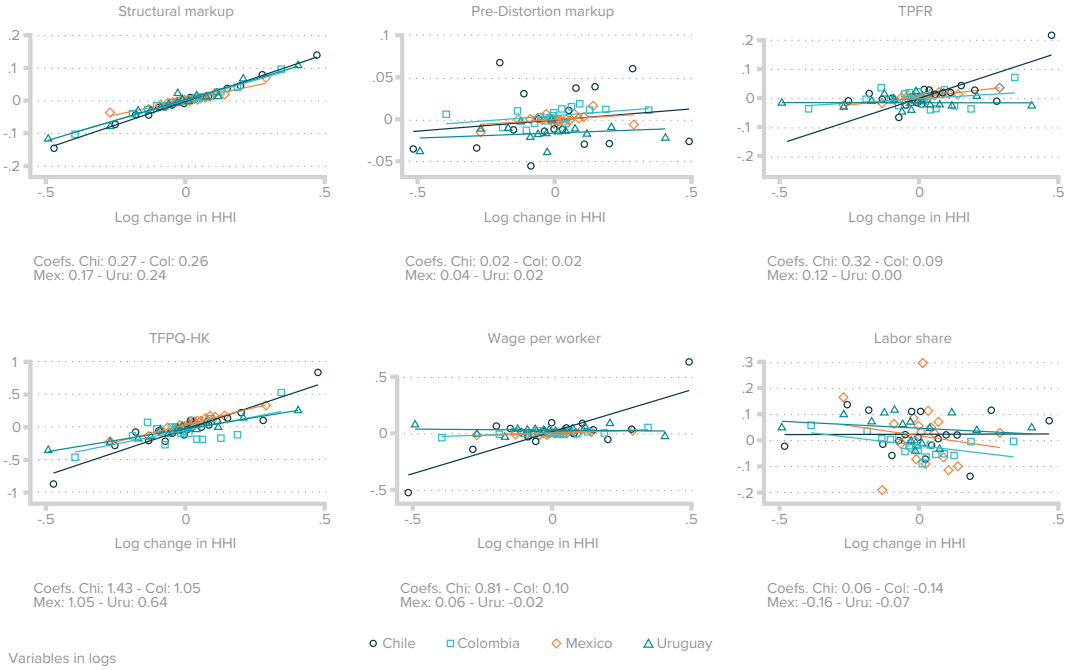
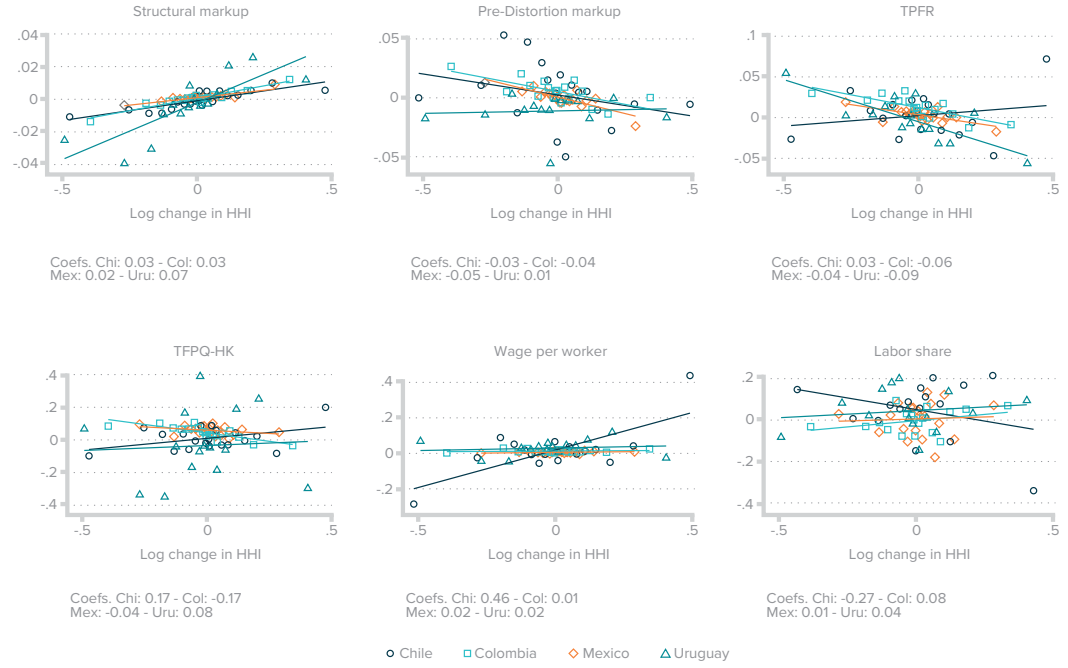
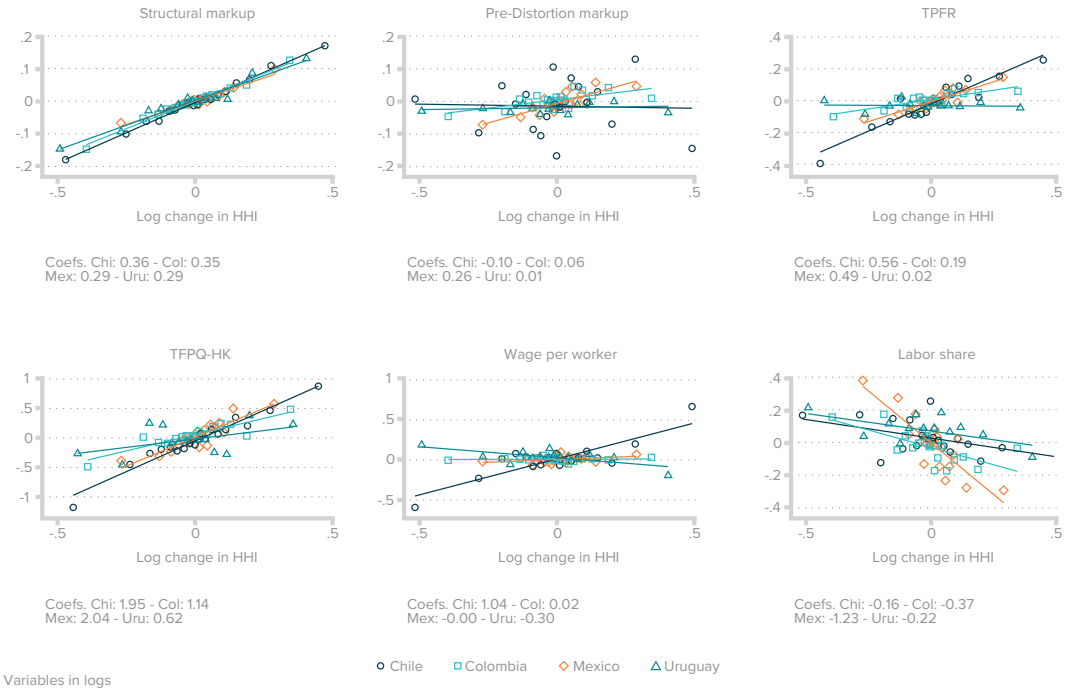


Figure 13. Good vs. bad market concentration: average establishment
Sector level changes in market concentration vs. changes in the following variables for average establishment



Variables in logs

Figure 14. Good vs. bad market concentration
Sector level changes in market concentration vs. changes in the following variables for dominant establishment



Variables in logs

Conclusion

What is the relationship between market concentration and inequality in the Latin America? This is the question that we tackle in this paper. Greater income inequality in the region compared to many advanced economies reflects partly a distribution that has a much thicker bottom tail, rather than being fully explained by the presence of a thicker or more extended right tail. We argue that the inequality/market concentration relationship in Latin America reflects the somewhat bipolar nature of market concentration in the region, characterized by the combination of highly concentrated rents in the upper end of the firm size distribution, associated to a concentrated ownership structure of the largest firms, and much more extreme market fragmentation in the lower end than is the case in advanced economies. A plethora of tiny businesses, with very low productivity and very low wages, absorb a much higher share of the labor force than in rich economies. The huge mass of people working in these businesses makes extremely precarious livelihoods.

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Appendix

Table A1. Size categories by country

	Size category			
	1-4	5-10	11-100	101 or more
Argentina	1-4	5-10	11-100	101 or more
Bolivia	1-4	5-10	11-100	101 or more
Brazil	1-5	6-10	11-50	51 or more
Chile	1-5	6-9	10-49	50 or more
Colombia	1-5	6-10	11-100	101 or more
Costa Rica	1-4	5-9	10-99	100 or more
Dominican Republic	1-4	5-10	11-99	100 or more
Mexico	1-5	6-10	11-100	101 or more
Paraguay	1-4	5-10	11-100	101 or more
Peru	1-4	5-10	11-100	101 or more
Uruguay	1-4	5-9	10-49	50 or more

Source: Authors' elaboration.

Table A2. Inequality and the size distribution of productive units by country

	Argentina							Bolivia						
	Q1	Q2	Q3	Q4	Q5	P95	Total	Q1	Q2	Q3	Q4	Q5	P95	Total
Self-employed	44	38	32	27	17	29	32	87	68	48	50	48	49	60
Micro employee	50	49	40	27	15	11	36	10	26	33	28	14	7	22
Non-micro employee	5	11	25	40	54	51	27	1	4	16	17	28	32	13
Micro owner	1	2	3	6	11	7	5	2	3	3	5	10	12	5
Non-micro owner	0	0	0	1	3	2	1	0	0	0	0	0	0	0
	Brazil							**Chile**						
	Q1	Q2	Q3	Q4	Q5	P95	Total	Q1	Q2	Q3	Q4	Q5	P95	Total
Self-employed	55	27	24	26	25	23	31	58	21	22	23	20	25	29
Micro employee	39	38	30	22	11	10	28	24	30	24	17	10	7	21
Non-micro employee	5	33	44	46	46	51	35	17	49	53	57	62	57	48
Micro owner	1	2	2	5	13	12	5	1	1	1	2	6	9	2
Non-micro owner	0	0	0	0	5	3	1	0	0	0	0	2	2	1
	Colombia							**Costa Rica**						
	Q1	Q2	Q3	Q4	Q5	P95	Total	Q1	Q2	Q3	Q4	Q5	P95	Total
Self-employed	79	65	38	22	28	20	46	48	26	12	12	15	10	23
Micro employee	17	29	30	24	10	9	22	43	43	35	23	11	6	31
Non-micro employee	3	4	30	51	50	57	27	7	28	51	60	63	74	42
Micro owner	1	2	3	3	10	13	4	2	3	2	4	9	7	4
Non-micro owner	0	0	0	0	1	1	0	0	0	0	0	2	3	1

	Dominican Republic							Mexico						
	Q1	Q2	Q3	Q4	Q5	P95	Total	Q1	Q2	Q3	Q4	Q5	P95	Total
Self-employed	61	43	42	49	49	67	48	46	16	9	8	8	7	17
Micro employee	28	28	16	9	6	4	17	33	58	49	41	23	18	41
Non-micro employee	10	29	40	36	34	20	30	4	17	36	44	53	59	31
Micro owner	1	1	2	6	11	9	4	16	8	6	7	15	15	11
Non-micro owner	0	0	0	0	1	0	0	0	0	0	0	1	1	0
	Paraguay							**Peru**						
	Q1	Q2	Q3	Q4	Q5	P95	Total	Q1	Q2	Q3	Q4	Q5	P95	Total
Self-employed	74	63	30	17	21	18	41	80	63	40	32	25	24	48
Micro employee	24	32	45	45	27	25	34	16	28	35	30	15	9	25
Non-micro employee	1	3	22	33	34	33	19	2	6	22	33	47	48	22
Micro owner	1	2	3	5	18	24	6	2	3	3	4	12	18	5
Non-micro owner	0	0	0	0	0	0	0	0	0	0	0	1	1	0
	Uruguay													
	Q1	Q2	Q3	Q4	Q5	P95	Total							
Self-employed	56	30	20	20	18	21	29							
Micro employee	34	39	28	19	9	4	26							
Non-micro employee	9	30	49	55	60	58	41							
Micro owner	1	1	2	6	10	13	4							
Non-micro owner	0	0	0	0	3	4	1							

Sources: Authors' calculations; national household surveys.
Note: Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Table A3. Components of the decomposition of personal income inequality in the lowest and highest income deciles in LA by country, 2019: Workers

Argentina

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Argentina			
Self employed	0.48	6.63	3.21	0.19	3.60	0.68
Micro salaried	0.47	6.17	2.89	0.10	3.16	0.32
Nonmicro salaried	0.03	6.08	0.20	0.52	3.48	1.79
Micro owner	0.01	6.41	0.09	0.15	3.74	0.57
Nonmicro owner	0.00	-	-	0.04	4.71	0.19
Total	**1.00**	**6.32**	**6.39**	**1.00**	**3.74**	**3.56**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Argentina - Latin America			
Self employed	-0.14	-1.22	-1.73	-0.01	-1.15	-0.27
Micro salaried	0.18	-0.22	1.04	0.00	-0.98	-0.08
Nonmicro salaried	0.00	-0.07	0.02	0.02	-1.81	-0.80
Micro owner	-0.04	-0.88	-0.28	-0.01	-2.31	-0.42
Nonmicro owner	-0.00	-	-	-0.01	-7.68	-0.38
Total	**0.00**	**-0.60**	**-0.95**	**-0.00**	**-2.79**	**-1.96**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Bolivia

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Bolivia			
Self employed	0.92	8.64	7.99	0.42	3.12	1.32
Micro salaried	0.05	6.44	0.31	0.12	3.40	0.41
Nonmicro salaried	0.00	8.60	0.04	0.33	3.52	1.17
Micro owner	0.02	7.19	0.16	0.12	3.55	0.43
Nonmicro owner	0.00	-	-	0.00	-	-
Total	**1.00**	**7.72**	**8.50**	**1.00**	**3.40**	**3.34**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Bolivia - Latin America			
Self employed	0.30	0.78	3.05	0.22	-1.63	0.37
Micro salaried	-0.24	0.04	-1.54	0.02	-0.74	0.01
Nonmicro salaried	-0.03	2.45	-0.14	-0.16	-1.77	-1.43
Micro owner	-0.03	-0.10	-0.22	-0.04	-2.50	-0.56
Nonmicro owner	-0.00	-	-	-0.05	-	-
Total	**0.00**	**0.79**	**1.15**	**-0.00**	**-3.13**	**-2.18**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Brazil

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Brazil			
Self employed	0.58	5.71	3.33	0.24	5.47	1.29
Micro salaried	0.38	5.05	1.93	0.07	4.47	0.31
Nonmicro salaried	0.03	4.39	0.13	0.45	6.32	2.84
Micro owner	0.01	5.06	0.03	0.17	7.10	1.19
Nonmicro owner	0.00	-	-	0.08	11.58	0.91
Total	**1.00**	**5.05**	**5.42**	**1.00**	**6.99**	**6.54**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Brazil - Latin America			
Self employed	-0.05	-2.14	-1.61	0.03	0.72	0.33
Micro salaried	0.09	-1.34	0.08	-0.03	0.33	-0.09
Nonmicro salaried	-0.00	-1.76	-0.05	-0.04	1.03	0.24
Micro owner	-0.05	-2.24	-0.35	0.00	1.05	0.20
Nonmicro owner	-0.00	-	-	0.03	-0.81	0.33
Total	**0.00**	**-1.87**	**-1.93**	**-0.00**	**0.47**	**1.01**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Chile

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Chile			
Self employed	0.64	4.93	3.13	0.18	5.55	1.03
Micro salaried	0.22	4.42	0.95	0.08	4.83	0.40
Nonmicro salaried	0.14	5.01	0.68	0.62	5.69	3.51
Micro owner	0.01	5.19	0.06	0.08	7.63	0.58
Nonmicro owner	0.00	-	-	0.04	9.46	0.36
Total	**1.00**	**4.89**	**4.82**	**1.00**	**6.63**	**5.88**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Chile - Latin America			
Self employed	0.01	-2.92	-1.80	-0.02	0.81	0.07
Micro salaried	-0.07	-1.98	-0.90	-0.01	0.69	-0.00
Nonmicro salaried	0.11	-1.14	0.50	0.13	0.39	0.91
Micro owner	-0.04	-2.11	-0.32	-0.09	1.58	-0.41
Nonmicro owner	0.00	-	-	-0.01	-2.93	-0.22
Total	**0.00**	**-2.04**	**-2.52**	**-0.00**	**0.11**	**0.36**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Colombia

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Colombia			
Self employed	0.83	7.55	6.26	0.28	3.72	1.03
Micro salaried	0.13	7.00	0.91	0.06	3.74	0.24
Nonmicro salaried	0.03	7.90	0.25	0.50	4.79	2.41
Micro owner	0.01	6.63	0.07	0.13	4.12	0.56
Nonmicro owner	0.00	-	-	0.02	8.34	0.17
Total	**1.00**	**7.27**	**7.48**	**1.00**	**4.94**	**4.41**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Colombia - Latin America			
Self employed	0.20	-0.31	1.32	0.08	-1.03	0.08
Micro salaried	-0.16	0.60	-0.94	-0.03	-0.40	-0.16
Nonmicro salaried	0.00	1.75	0.06	0.01	-0.50	-0.19
Micro owner	-0.04	-0.67	-0.31	-0.03	-1.93	-0.44
Nonmicro owner	-0.00	-	-	-0.03	-4.06	-0.40
Total	**0.00**	**0.35**	**0.13**	**-0.00**	**-1.58**	**-1.12**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Costa Rica

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Costa Rica			
Self employed	0.55	9.51	5.20	0.17	4.71	0.78
Micro salaried	0.40	8.51	3.41	0.07	4.07	0.30
Nonmicro salaried	0.04	8.52	0.35	0.61	4.49	2.76
Micro owner	0.01	8.11	0.09	0.11	5.44	0.63
Nonmicro owner	0.00	-	-	0.03	7.79	0.25
Total	**1.00**	**8.66**	**9.05**	**1.00**	**5.30**	**4.71**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Costa Rica - Latin America			
Self employed	-0.08	1.65	0.26	-0.04	-0.04	-0.18
Micro salaried	0.11	2.12	1.56	-0.02	-0.07	-0.10
Nonmicro salaried	0.01	2.37	0.17	0.12	-0.80	0.16
Micro owner	-0.04	0.82	-0.28	-0.05	-0.61	-0.37
Nonmicro owner	-0.00	-	-	-0.01	-4.61	-0.33
Total	**0.00**	**1.74**	**1.70**	**-0.00**	**-1.22**	**-0.81**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Dominican Republic

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Dominican Republic			
Self employed	0.74	3.95	2.92	0.49	4.77	2.35
Micro salaried	0.20	3.31	0.67	0.04	4.43	0.19
Nonmicro salaried	0.05	3.26	0.17	0.30	4.55	1.37
Micro owner	0.01	4.62	0.03	0.14	6.29	0.89
Nonmicro owner	0.00	-	-	0.02	9.91	0.21
Total	**1.00**	**3.78**	**3.79**	**1.00**	**5.99**	**5.01**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Dominican Republic - Latin America			
Self employed	0.11	-3.90	-2.01	0.29	0.03	1.40
Micro salaried	-0.09	-3.09	-1.18	-0.05	0.29	-0.21
Nonmicro salaried	0.02	-2.89	-0.02	-0.19	-0.74	-1.23
Micro owner	-0.04	-2.68	-0.34	-0.02	0.24	-0.10
Nonmicro owner	-0.00	-	-	-0.03	-2.48	-0.37
Total	**0.00**	**-3.14**	**-3.56**	**0.00**	**-0.53**	**-0.51**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Mexico

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Mexico			
Self employed	0.56	11.69	6.55	0.07	4.58	0.33
Micro salaried	0.24	8.06	1.92	0.16	4.08	0.65
Nonmicro salaried	0.02	7.43	0.15	0.56	4.73	2.63
Micro owner	0.18	10.87	1.95	0.19	6.16	1.17
Nonmicro owner	0.00	-	-	0.02	20.32	0.49
Total	**1.00**	**9.51**	**10.57**	**1.00**	**7.97**	**5.26**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Mexico - Latin America			
Self employed	-0.07	3.84	1.61	-0.13	-0.16	-0.62
Micro salaried	-0.05	1.66	0.07	0.06	-0.06	0.24
Nonmicro salaried	-0.01	1.28	-0.03	0.06	-0.56	0.03
Micro owner	0.13	3.58	1.57	0.03	0.11	0.17
Nonmicro owner	0.00	-	-	-0.02	7.93	-0.09
Total	**0.00**	**2.59**	**3.22**	**-0.00**	**1.45**	**-0.26**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Paraguay

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Paraguay			
Self employed	0.74	6.21	4.60	0.22	3.12	0.70
Micro salaried	0.25	5.37	1.34	0.20	2.82	0.57
Nonmicro salaried	0.01	5.35	0.05	0.31	2.94	0.91
Micro owner	0.00	10.12	0.02	0.25	3.89	0.99
Nonmicro owner	0.00	-	-	0.01	5.73	0.05
Total	**1.00**	**6.76**	**6.00**	**1.00**	**3.70**	**3.22**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Paraguay - Latin America			
Self employed	0.11	-1.64	-0.34	0.02	-1.62	-0.25
Micro salaried	-0.04	-1.03	-0.51	0.11	-1.32	0.17
Nonmicro salaried	-0.02	-0.80	-0.14	-0.18	-2.35	-1.68
Micro owner	-0.05	2.82	-0.35	0.09	-2.16	-0.01
Nonmicro owner	-0.00	-	-	-0.04	-6.66	-0.53
Total	**0.00**	**-0.16**	**-1.34**	**-0.00**	**-2.82**	**-2.30**

Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Peru

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Peru			
Self employed	0.83	10.64	8.88	0.21	4.00	0.85
Micro salaried	0.13	9.36	1.20	0.09	3.94	0.37
Nonmicro salaried	0.01	9.80	0.14	0.52	4.71	2.44
Micro owner	0.02	10.81	0.24	0.16	4.89	0.78
Nonmicro owner	0.00	-	-	0.01	6.09	0.08
Total	**1.00**	**10.15**	**10.47**	**1.00**	**4.72**	**4.53**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Peru - Latin America			
Self employed	0.21	2.79	3.95	0.01	-0.74	-0.10
Micro salaried	-0.16	2.96	-0.65	-0.00	-0.20	-0.03
Nonmicro salaried	-0.02	3.65	-0.04	0.03	-0.59	-0.16
Micro owner	-0.03	3.52	-0.14	-0.00	-1.16	-0.21
Nonmicro owner	-0.00	-	-	-0.03	-6.30	-0.49
Total	**0.00**	**3.23**	**3.12**	**0.00**	**-1.80**	**-0.99**

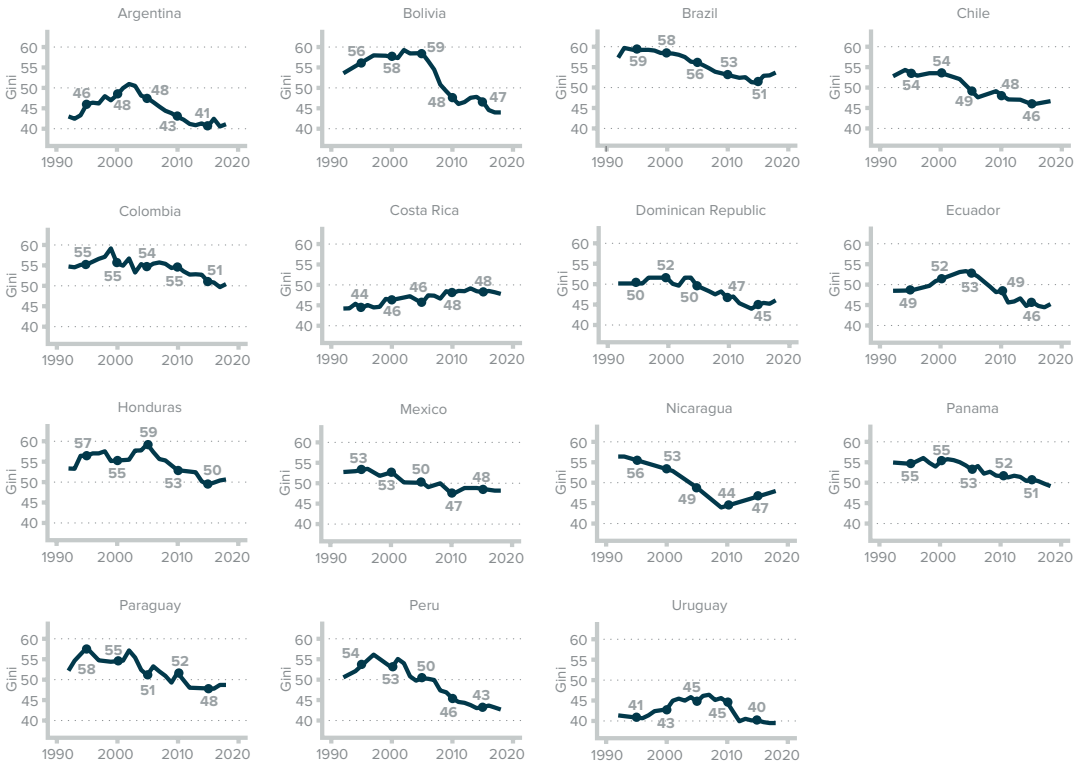
Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers.

Uruguay

	Decile 1			Decile 10		
	Share	P50/D1	Share * P50/D1	Share	D10/P50	Share * D10/P50
			Uruguay			
Self employed	0.62	6.72	4.20	0.20	4.35	0.88
Micro salaried	0.31	5.98	1.84	0.06	3.83	0.24
Nonmicro salaried	0.06	6.25	0.40	0.58	4.20	2.42
Micro owner	0.00	5.12	0.02	0.11	4.40	0.50
Nonmicro owner	0.00	-	-	0.04	5.98	0.27
Total	**1.00**	**6.02**	**6.46**	**1.00**	**4.55**	**4.31**
			Latin America			
Self employed	0.63	7.85	4.94	0.20	4.74	0.95
Micro salaried	0.29	6.40	1.85	0.10	4.14	0.40
Nonmicro salaried	0.03	6.15	0.18	0.49	5.29	2.60
Micro owner	0.05	7.29	0.38	0.16	6.05	0.99
Nonmicro owner	0.00	-	-	0.05	12.39	0.57
Total	**1.00**	**6.92**	**7.35**	**1.00**	**6.52**	**5.52**
			Uruguay - Latin America			
Self employed	-0.00	-1.13	-0.74	0.00	-0.39	-0.07
Micro salaried	0.02	-0.42	-0.01	-0.04	-0.30	-0.17
Nonmicro salaried	0.03	0.10	0.21	0.09	-1.10	-0.18
Micro owner	-0.05	-2.17	-0.36	-0.05	-1.65	-0.49
Nonmicro owner	-0.00	-	-	-0.00	-6.42	-0.31
Total	**0.00**	**-0.91**	**-0.89**	**-0.00**	**-1.97**	**-1.21**

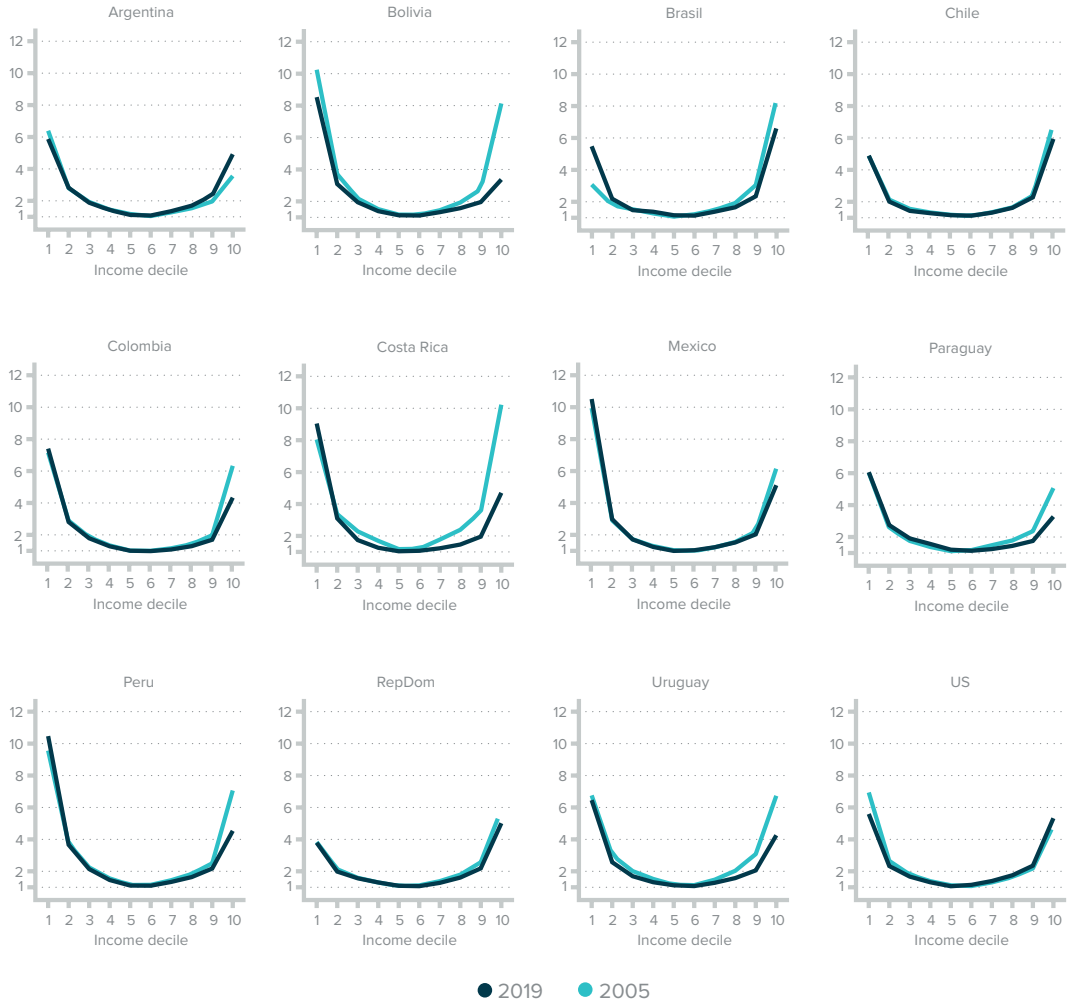
Sources: Authors' calculations; national household surveys.
Note: Data for Latin America corresponds to the weighted average between Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Mexico, Paraguay, Peru, and Uruguay. Household survey data for Latin America in 2019 except for Chile (2017) and Mexico (2018). Individuals that report personal income equal to zero or negative in each country, and those who do not report their status along the reported dimensions, are excluded. These statistics also exclude government, defense, and education workers. Personal income excludes government transfers and occasional earnings.

Figure A1. Evolution of Gini in each country in Latin America



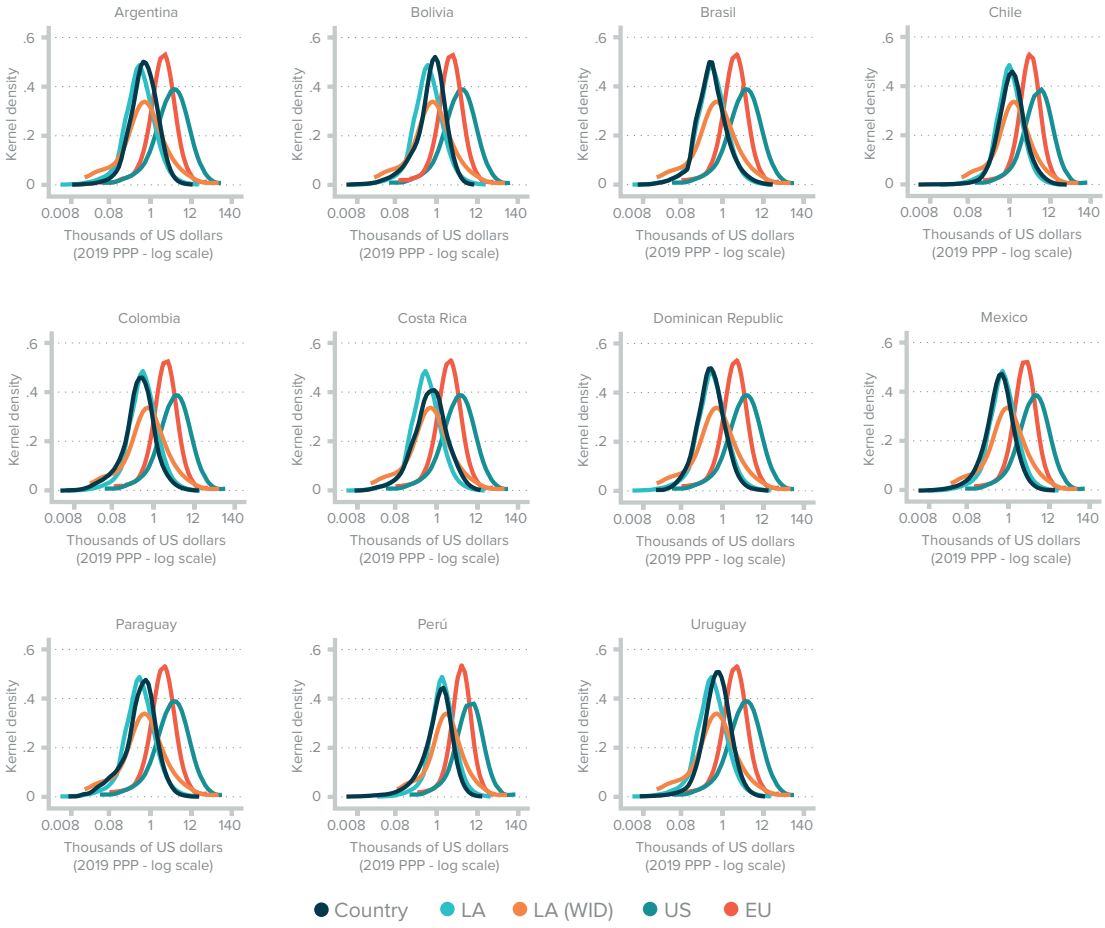
Note: Gasparini and Cruces (2021).

Figure A2. Decennial shifts in the income distribution by country Latin America



Note: Household survey data for Latin America in 2019, except for Chile (2017) and Mexico (2018), and 2005 except for Chile (2003) and Colombia (2007). The figure shows the distance between the average income in each percentile and the average income in the 50th percentile just as in Figure 4.

Figure A3. Income distribution in each country in Latin America compared to LA average, US and EU



Methodological appendix for data with establishment level data

Data

The main data source for this part of the project consists of annual manufacturing surveys from five Latin American countries: Chile, Colombia, Ecuador, Mexico, and Uruguay. From Chile, there is data for the period 2000-2015 from the *Encuesta Nacional Industrial Anual*. In Colombia, we have the *Encuesta Annual Manufacturera* for the period 1997-2016. For Ecuador, data is available only for 2016-2017 from the *Encuesta de Manufactura y Minería*. While the survey includes mining sectors, we exclude them in our sample. In Mexico, we count on information from the *Encuesta Annual de la Industria Manufacturera* for the years 2009-2016. Finally, we use data from Uruguay's *Encuesta Anual de Actividad Económica* for the period 2002-2016. This survey also includes information from non-manufacturing sectors that are excluded from our sample.

Surveys from Chile and Colombia are census data for manufacturing establishments with at least 10 employees or above a certain revenue threshold. The survey from Ecuador covers establishments with at least 10 employees or revenue above 50,000 USD with a sampling procedure. In Uruguay, the survey is a census for establishments with at least 50 employees and there is a sampling for establishments with between 5 and 49 employees. Mexico's survey has a more complicated sampling procedure. Out of 239 sectors following a 6-digit NAICS-Mexico code, there is a non-probabilistic sampling in 235 of them, out of which, establishments are included in the sample until a certain threshold is met, while the threshold varies by sectors. 171 sectors require an 80% revenue threshold, 48 sectors require a 60% revenue threshold, and the remaining 16 sectors are allowed a threshold below 60%. Overall, Mexico's sampling covers 99.3% of all manufacturing revenue and 96.6% of the manufacturing employment. To harmonize data from all sources, we restrict data to only establishments with at least 10 employees.

Finally, each survey classifies establishments according to different sector classifications. Chile, Colombia, Ecuador, and Uruguay use ISIC classifications, revision 3 for Chile and revision 4 for the other countries. In all cases we work with sector level at the three-digit sector. This gives us 35 different sectors in Uruguay, 44 in Ecuador, 45 in Chile, and 56 in Colombia. Finally, in Mexico we work with NAICS-Mexico at the 4-digit level which gives a similar disaggregation to the 3-digit ISIC revision 4 with 85 different manufacturing sectors.

Markups and productivity

A. Pre-distortion markups

To determine pre-distortion markups (i.e., De Loecker), it is best to depart from a firm's cost minimization problem. We have a firm i that produces with technology $Q_{it}=F_{it}(K_{it},V_{it})=Af(K_{it},V_{it})$ where A is an index of Hicks-neutral technology change, K_{it} is the stock of capital and V_{it} is a bundle of variable inputs (such as labor, material, inputs, energy), and t indexes periods. The firm minimizes the cost of producing Q_{it} units of output, considering that factor markets may not be perfectly competitive:

$$\min \mathscr{L} = \left(R_{it}(K_{it})K_{it} + W_{it}(V_{it})V_{it}\right) + \lambda_{it}(Q - F(K_{it}, V_{it}) + F_{it}$$

where R_{it} and W_{it} are the rental price of capital and the variable input, respectively, λ_{it} is the Lagrange multiplier for output, and F_{it} is a fixed cost (fixed with respect to Q).

We assume that K_{it} is a semi-fixed input that was chosen in the previous period while V_{it} can be flexibly chosen by the firm in the present period. The first order conditions imply:

$$\frac{\partial \mathscr{L}}{\partial V_{it}} = W_{it} + V_{it}\frac{\partial W_{it}}{\partial V_{it}} - \lambda_{it}\frac{\partial Q_{it}}{\partial V_{it}} = 0$$

Rearranging terms:

$$\frac{\partial Q_{it}}{\partial V_{it}} = \frac{W_{it}}{\lambda_{it}}\left(1 + \frac{V_{it}}{W_{it}}\frac{\partial W_{it}}{\partial V_{it}}\right)$$

$$\frac{\partial Q_{it}}{\partial V_{it}} = \frac{W_{it}}{\lambda_{it}}\left(1 + \frac{1}{\varepsilon_{it}^{V}}\right) = \frac{W_{it}}{\lambda_{it}}\left(\frac{1}{\mu_{it}^{V}}\right)$$

where ε_{it}^{V} is the price elasticity in the market for variable inputs and μ_{it}^{V} is i's markdown in period t. Further denoting marginal cost as MC_{it} (which equals λ_{it} at the optimum) and defining the markup as $\mu_{it} = \frac{P_{it}}{MC_{it}}$. If we multiply both sides by we obtain the following implications of cost minimization.

$$\theta_{it}^{V} \equiv \frac{\partial Q_{it}}{\partial V_{it}} \frac{V_{it}}{Q_{it}} = \frac{W_{it} V_{it}}{Q_{it} * MC_{it}} \left(\frac{1}{\mu_{it}^{V}} \right)$$

$$\theta_{it}^{V} = \frac{W_{it} V_{it}}{Q_{it} * P_{it}} \left(\frac{\mu_{it}}{\mu_{it}^{V}} \right)$$

With this last expression, we can measure the markup-markdown ratio as the ratio between the variable factor's elasticity in production and its revenue share. This markup-markdown ratio is what we consider as the De Loecker markup. It is worth noting that behind this measure captures both market power in input and output markets.

$$\mu_{it}^{DL} = \frac{\mu_{it}}{\mu_{it}^{V}} = \frac{\theta_{it}^{V}}{\frac{W_{it} V_{it}}{Q_{it} * P_{it}}}$$

To give this an empirical approximation considering the available data from the manufacturing surveys, we consider variable inputs as both labor and materials. Therefore, if we consider variable inputs to be a Cobb-Douglas composite of labor and materials $V_{it} = L_{it}^{\alpha} M_{it}^{\phi}$ we can measure De Loecker markups $\mu_{it}^{DL} = \frac{\alpha + \phi}{\frac{w_{it} L_{it} + Pm_{it} M_{it}}{Q_{it} * P_{it}}}$ ion, where w_{it} is the wage per worker and Pm_{it} are the average

To calculate markups, we use factor elasticities of production calculated in Eslava & Haltiwanger (2021) for labor and materials and observable data of a firm's payroll, material input costs and revenue.

Structural markups

The procedure to produce our structural markups is just as in Eslava & Haltiwanger (2021) with the proof in appendix D. Unlike for De Loecker markups, we depart from a firm's maximization problem to include revenue distortions but maintaining the same technology $Q_{it}=F_{it}(K_{it},V_{it})=Af(K_{it},V_{it})$. Additionally, we consider consumers preference through a nested CES demand structure. First, take the consumer's problem in which utility is given by the following function:

$$U\left(Q_{1t}, \ldots, Q_{Nt}\right) = \left(\sum_{I_t} d_{it} Q_{it}^{\frac{\sigma - 1}{\sigma}} \right)^{\frac{\sigma}{\sigma - 1}}$$

Where the production Q_{it} of firm i in period t is also given by a CES production function of all the individual products q_{ijt} produced by the firm:

$$Q_{it} = \left(\sum_{\Omega_t^i} d_{ijt} \, q_{ijt}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

Additionally, the consumer faces a budget constrain:

$$\sum_{I_t}^{N_{it}} \sum_{\Omega_t^i} p_{ijt} q_{itj} = E_t$$

The consumer optimization implies that the demand for product and product in period are, respectively, going to be given by:

$$q_{ijt} = d_{ij}^{\sigma} d_{ijt}^{\sigma} \left(\frac{P_{it}}{P_t} \right)^{-\sigma} \left(\frac{p_{ijt}}{P_{it}} \right)^{-\sigma} \frac{E_t}{P_t}$$

$$Q_{it} = d_{it}^{\sigma} P_{it}^{-\sigma} \frac{E_t}{P_t^{1-\sigma}}$$

Where

$$P_t = \left(\sum_{I_t} d_{it} P_{it}^{1-\sigma} \right)^{\frac{1}{1-\sigma}}$$

Now, on the firm side, each firm solves:

$$Max \, \pi_{it} = \left(1 - \tau_{it}\right) P_{it} Q_{it} - \left(R_{it} K_{it} + W_{it}\left(V_{it}\right) V_{it} \right) = \left(1 - \tau_{it}\right) P_{it} Q_{it} - TC_{it}(Q_{it})$$

This problem leads to the first order condition:

$$\left(P_{it} + Q_{it} \frac{\partial P_{it}}{\partial Q_{it}} \right) = \frac{MC_{it}}{\left(1 - \tau_{it}\right)}$$

By dividing both sides by P_{it} we obtain a measure for markups after distortion, which we call structural markups, $\mu_{it}^{S} = \frac{P_{it}}{MC_{it}\left(1 - \tau_{it}\right)^{-1}}$. This markup is inclusive of revenue distortions such as in Hsieh and Klenow (2009) and Eslava & Haltiwanger (2021):

$$\frac{1}{\mu_{it}} \equiv \frac{MC_{it}}{P_{it}\left(1 - \tau_{it}\right)} = \left(1 + \frac{Q_{it}}{P_{it}} \frac{\partial P_{it}}{\partial Q_{it}} \right) = \left(1 - \frac{1}{\varepsilon} \right)$$

Where $\varepsilon \equiv - \frac{Q_{it}}{P_{it}} \frac{\partial P_{it}}{\partial Q_{it}}$ is the price elasticity of substitution.

Now, we can express the inverse of the demand elasticity by the following expression. Which

comes from three considerations: 1) knowing that the demand elasticity as perceived by the firm is $\varepsilon \equiv -\frac{Q_{it}}{P_{it}}\frac{dP_{it}}{dQ_{it}}$, 2) that $P_{it} = d_{it}Q_{it}^{\frac{-1}{\sigma}}\left(\frac{E_t}{P_t^{1-\sigma}}\right)^{\frac{1}{\sigma}}$, by rearranging the expression for Q_{it} in terms of P_{it}, and 3) allowing for market power so that $\frac{dP_t}{dQ_{it}} \neq 0$.

$$\varepsilon_{it}^{-1} = -\left(\frac{\partial P_{it}}{\partial Q_{it}} + \frac{\partial P_{it}}{\partial P_t}\frac{\partial P_t}{\partial Q_{it}}\right)\frac{Q_{it}}{P_{it}}$$

$$= -\left(-\frac{1}{\sigma}\frac{P_{it}}{Q_{it}} + \left(\frac{\sigma-1}{\sigma}\right)\frac{P_{it}}{P_t}\frac{\partial P_t}{\partial Q_{it}}\right)\frac{Q_{it}}{P_{it}}$$

$$= \left(\frac{1}{\sigma} - \left(\frac{\sigma-1}{\sigma}\right)\frac{\partial P_t}{\partial Q_{it}}\frac{Q_{it}}{P_t}\right)$$

$$= \left(\frac{1}{\sigma} + \left(\frac{\sigma-1}{\sigma}\right)s_{it}\right)$$

Where the last line uses Sheppard's lemma: $s_{it} = -\frac{\partial P_t}{\partial Q_{it}}\frac{Q_{it}}{P_t}$.

This result implies that we can now define our structural markup as presented in the main text of the paper by replacing the last expression for the demand elasticity:

$$\frac{1}{\mu_{it}^S} = \left(1 - \frac{1}{\varepsilon}\right)$$

$$\mu_{it}^S = 1 - \frac{1}{\sigma} + \left(\frac{\sigma-1}{\sigma}\right)s_{it} = \frac{\sigma}{(\sigma-1)\left(1-s_{it}\right)}$$

Relationship between structural and pre-distortion markups

Our measures of structural markups and De Loecker markups are closely related. A main difference between De Loecker and structural approximations is that the latter considers revenue distortions. This difference accounts for the differences between both markups.

We depart from a firm maximization problem in which firm produces with technology $Q_{it}=F_{it}(K_{it},V_{it})=Af(K_{it},V_{it})$ where A is an index of Hicks-neutral technology change, K_{it} is the stock of capital and V_{it} is a bundle of variable inputs (such as labor, material, inputs, and energy), and t indexes periods. Each firm faces unit costs of variable inputs given by W_{it} and may hold power in input markets, such that W_{it} is a function of V_{it}. The firm solves

$$Max\ \pi_{it} = \left(1-\tau_{it}\right)P_{it}Q_{it} - \left(R_{it}K_{it} + W_{it}\left(V_{it}\right)V_{it}\right)$$

where τ_{it} is an idiosyncratic revenue wedge, which the firm takes as given. The first order condition for the optimal choice of variable inputs is:

$$(1-\tau_{it})MR_{it}\frac{\partial F_{it}}{\partial V_{it}} = W_{it}\left(1+\frac{V_{it}}{W_{it}}\frac{\partial W_{it}}{V_{it}}\right)$$

$$\frac{\partial F_{it}}{\partial V_{it}} = \frac{W_{it}}{(1-\tau_{it})\,MR_{it}}\left(1+\frac{1}{\varepsilon_{it}^{V}}\right)$$

Where $MR_{it} = \frac{\partial(P_{it}Q_{it})}{\partial Q_{it}}$. At the optimum, $MR_{it} = MC_{it}$ where MC_{it} is the marginal cost. Replacing the previous expression, and denoting μ_{it}^{V} as the firm's markdown.

$$\frac{\partial F_{it}}{\partial V_{it}} = \frac{W_{it}}{(1-\tau_{it})\,MR_{it}}\left(\frac{1}{\mu_{it}^{V}}\right)$$

By multiplying both sides by $\frac{V_{it}}{P_{it}Q_{it}}$

$$\frac{\frac{\partial F_{it}}{\partial V_{it}}\frac{V_{it}}{Q_{it}}}{\frac{W_{it}V_{it}}{P_{it}Q_{it}}} = \frac{\mu_{it}}{(1-\tau_{it})}\left(\frac{1}{\mu_{it}^{V}}\right)$$

On the left-hand side we have the De-Loecker markup, where we provide an expression for it in terms of our structural marku the markdown.

$$\mu_{it}^{DL} = \frac{\mu_{it}^{S}}{(1-\tau_{it})}\left(\frac{1}{\mu_{it}^{V}}\right)$$

TFP and TFPQ-HK

To measure productivity, we consider a Cobb-Douglas production function with three inputs: labor, capital, and materials; and a component of technical efficiency, A_{it} .

$$Q_{it} = A_{it}L_{it}^{\alpha}K_{it}^{\beta}M_{it}^{\phi}$$

For this, we calculate the total factor productivity of revenue (TFPR) as a residual through the following equation:

$$TFPR_{it} = \frac{R_{it}}{L_{it}^{\alpha}K_{it}^{\beta}M_{it}^{\phi}}$$

We also calculate an output efficiency measure ($TFPQ\_HK$) which is given by:

$$TFPQ\_HK = \frac{R_{it}^{\frac{1}{1-\frac{1}{\sigma}}}}{L_{it}^{\alpha}K_{it}^{\beta}M_{it}^{\phi}}$$

$TFPQ\_HK$ is a welfare-increasing measure of productivity that combines both technical efficiency and demand, characterized in Hsieh & Klenow (2009) and Eslava & Haltiwanger (2021). To show how we obtain this composite measure of demand and technical efficiency without the need for information on output prices, we depart from the consumer optimization demand for A_{it} when considering the CES utility (as shown for structural markups before).

$$Q_{it} = d_{it}^{\sigma} P_{it}^{-\sigma} \frac{E_t}{P_t^{1-\sigma}}$$

We can solve for P_{it}, noting three facts: 1) $E_t = P_t Q_t$, 2) $P_t = D_t Q_t^{-\frac{1}{\sigma}}$, and 3) $D_{it} = D_t d_{it}$:

$$P_{it} = d_{it} Q_{it}^{-\frac{1}{\sigma}} \left(\frac{E_t}{P_t^{1-\sigma}} \right)^{\frac{1}{\sigma}} = d_{it} Q_{it}^{-\frac{1}{\sigma}} Q_t^{\frac{1}{\sigma}} P_t = D_t d_{it} Q_{it}^{-\frac{1}{\sigma}} = D_{it} Q_{it}^{-\frac{1}{\sigma}}$$

With this result, we can measure revenue as:

$$R_{it} \equiv P_{it} Q_{it} = D_{it} Q_{it}^{1-\frac{1}{\sigma}} = D_{it} (A_{it} L_{it}^{\alpha} K_{it}^{\beta} M_{it}^{\phi})^{1-\frac{1}{\sigma}}$$

Now, the composite shock of technical efficiency and demand is given by:

$$TFPQ\_HK_{it} \equiv A_{it} D_{it}^{\frac{1}{1-\frac{1}{\sigma}}} = \frac{R_{it}^{\frac{1}{1-\frac{1}{\sigma}}}}{L_{it}^{\alpha} K_{it}^{\beta} M_{it}^{\phi}}$$

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